

IMPLICATIONS OF THE MIDDLE EASTERN CRISIS FOR NEAR-TERM AND MID-TERM OIL SUPPLY

HEARING BEFORE THE COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

IMPLICATIONS OF THE MIDDLE EASTERN CRISIS FOR NEAR-TERM AND
MID-TERM OIL SUPPLY

SEPTEMBER 13, 1990



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IMPLICATIONS OF THE MIDDLE EASTERN CRISIS FOR NEAR-TERM AND MID-TERM OIL SUPPLY

THURSDAY, SEPTEMBER 13, 1990

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 9:40 a.m. in room SD-366, Dirksen Senate Office Building, Hon. J. Bennett Johnston, chairman, presiding.

OPENING STATEMENT OF HON. J. BENNETT JOHNSTON, U.S. SENATOR FROM LOUISIANA

The CHAIRMAN. The hearing will come to order.

The Secretary must leave at 10:35 a.m. to catch a plane, and so after a very short opening statement from me I would like to go directly to the Secretary. Then when he finishes, members who wish to make an opening statement may do so. Henson Moore has agreed to stay the rest of the night.

[Laughter.]

The CHAIRMAN. It is a unique facet of democracy that it responds best but sometimes only in the face of a crisis. It is tragic that it has taken the firing of gun shots and the deployment of troops in the Middle East to awaken America to the importance of domestic energy policy.

We will hear today from the Secretary of Energy and the Deputy Secretary of Energy on the implications of the crisis for our policy and for the near-term and mid-term oil supply.

The Middle East crisis highlights our strategic and economic vulnerability when it comes to that region of the world. We have allowed ourselves to become subject to the whims of the Persian Gulf dictators with respect to the lifeblood of our economy, oil.

The crisis raises the serious issue of where we will replace the oil lost to the embargo. For our economic policy, for our energy policy and for our military policy we need to know whether there will be a shortfall and, if so, how big it will be. I worry that the Administration may have based its policy decisions to date on overly optimistic estimates of the world's ability to offset the shortfall.

This shortfall may involve more than crude oil. It is a disturbing possibility that our refinery capacity may not be adequate to provide needed product. Some of us have been concerned for several years over the health of the refining industry. Many refineries have been forced to shut down over the past decade for economic

reasons. I fear that this now leaves us vulnerable to a shortfall in refined product such as gasoline and heating oil.

In response to the crisis we must take steps to increase our supply of energy from secure sources. First, we must revive our domestic oil and gas industry. Other sources of energy here at home must be encouraged as well. In addition, demand should be reduced through renewed conservation efforts.

This committee has worked diligently to further energy conservation in our Nation, reporting at least 20 separate pieces of legislation dealing with energy conservation and renewable energy during the past 5 Congresses. Eight of these measures—ranging from one dealing with fuel cells, to Federal energy management to standards for appliances—went on to become public law.

Another step taken by this Committee and the Congress in response to the energy crisis in the early 1970's was the creation of the Strategic Petroleum Reserve. I am pleased that just last night we were able to conclude an agreement with the House to expand the current Strategic Petroleum Reserve from its current limit of 750 million barrels to 1 billion barrels of oil. This measure would authorize the leasing of crude oil supplies in order to expedite the rate at which we fill the reserve.

The legislation will also authorize for the first time a pilot program to test the feasibility of a refined product reserve and provides for a limited drawdown in the event of a domestic supply disruption.

To date, the President has declined to draw down any of the 590 million barrels of oil stockpiled in the SPR. As stated, the policy is to relieve shortfalls, not merely suppress prices.

I hope to hear from the Secretary regarding when and under what circumstances this tool will be used to cushion any oil shortfalls and what efforts are under way to coordinate the drawdown of oil reserves held by our allies. The SPR is our best and perhaps only meaningful weapon to offset a crude shortfall. If necessary it should be used, but it should be used thoughtfully.

Our Nation must have a farsighted energy policy which has as its centerpiece energy independence. Unfortunately, for the past decade the energy policy of this Nation has been in reality a one-word policy: import. Regrettably, it took a foreign despot to expose this disastrous policy for what it is.

I hope and expect that the Middle East crisis will bring resolve to all our efforts to implement a coherent and comprehensive energy policy, a policy which will once and for all insulate us from the likes of Saddam Hussein.

I thank the Secretary and the Deputy Secretary for being here, and I look forward to hearing their testimony.

[The prepared statements of Senators Bingaman, Conrad, Heflin, Rockefeller, McClure, Murkowski, Nickles, Burns, and McConnell follow:]

PREPARED STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

BINGAMAN QUESTIONS THE GOVERNMENTS ROLE IN DEALING WITH SHORTFALL OF OIL SUPPLIES, LACK OF NATIONAL ENERGY POLICY

WASHINGTON.—Senator Jeff Bingaman (D-NM) today at an Energy Committee hearing on the implications of the Middle East crisis questioned the federal government's role in dealing with the near-term consequences of the shortfall of world oil supplies and its inability to implement a long-term national energy policy.

Bingaman was addressing his remarks to Energy Secretary James D. Watkins and Deputy Secretary Henson Moore, who were testifying before the Senator and other members of the Senate Energy and Natural Resources Committee.

Bingaman said: "From an energy policy perspective, the Persian Gulf crisis poses us with two distinct but interrelated challenges. First, what is the role of the federal government in dealing responsibly with the near-term consequences of the shortfall of world oil supplies and the market's response to this situation? . . . Second, how will our experience in responding to the immediate crisis contribute to the formation of a long-term national energy policy?"

Bingaman posed a number of questions to Watkins and Moore, including asking when the correct time for a draw down of the United States Strategic Petroleum Reserve and how would the oil from the reserve be allocated? The Senator also questioned what can be done to prevent pure profiteering that victimizes the American consumer?

In speaking about the lack of a national energy policy, Bingaman told the Secretary that "while the Persian Gulf crisis should serve as the impetus for a national energy policy, the policy that results must be more than an exercise in crisis policy-making."

Bingaman proposes a national energy policy that achieves a balance. Bingaman said the policy he is recommending "should steer away from a blind reliance on market forces where to do so produces fleeting short-term benefits in return for long-term vulnerability. At the same time, it should be a policy that avoids the panacea of price controls and allocations schemes which in the short term cushions consumers from reality and in the long term frustrate the market forces that ensure a reliable supply of energy at reasonable cost."

Bingaman, as chairman of the Mineral Resources Subcommittee, will hold follow-up hearings to focus more closely on the particulars of formulating a national energy policy. The hearing is tentatively scheduled to be held on November 1 in Albuquerque.

PREPARED STATEMENT OF HON. KENT CONRAD, U.S. SENATOR FROM NORTH DAKOTA

I welcome the Secretary and the Assistant Secretary to the Energy Committee this morning, and I commend the Chairman, Senator Johnston, for calling the hearing.

The events in the Persian Gulf have reawakened America to the fact that our energy policy remains too vulnerable to the dictates of foreign governments.

Two years ago when the Senate was considering Senator Bentsen's "Peril Point" legislation, I said that the signs of an impending energy crisis were clearly before us, and that when the next crisis came, no one should claim that we did not have adequate warning.

While one may not yet classify the present situation as a "crisis," all of the ingredients for one—higher imports, lower domestic production and political volatility in the Middle East—are present, and a sudden, unfortunate turn of events could transform the situation quickly.

In short, as we contemplate reductions in the worldwide supply of oil, we are reminded also that we have squandered an opportunity during the last ten years to strengthen our energy position. The Chairman characterized succinctly the energy policy of the previous administration when he said that it can be described in one word: "import."

To lessen our dependence upon imports, many of us have long argued that we need to take aggressive action. Those steps should include greater conservation, sustained development of alternative energy sources, and a variable tariff on imported oil to strengthen our domestic energy industry.

The Senate may soon have an opportunity to enhance conservation if it considers S. 1224, the so-called "Bryan Bill," to increase fuel efficiency in automobiles and light trucks. I am a cosponsor of that legislation, and I hope that the administration will rethink its opposition to this proposal.

Alternate fuels, like ethanol and synthetic fuels, can also help reduce our dependence on foreign oil, and I hope that the administration recognizes that alternate fuels have been a valuable insurance policy against unwarranted increases in the price of world oil. For example, the Great Plains Coal Gasification Plant in my state is producing large quantities of quality synthetic natural gas, and it deserves our continued support.

Because of investments like the one we made in Great Plains, OPEC members already know that price increases beyond a certain point will yield no additional return. If we pursue sustained support for alternate fuels, we can reduce that point even further.

I would also like to say a word about the immediate effects of the present situation. The President stated in his address to the nation this week that he would not tolerate unreasonable profiteering in this crisis by America's major oil and gas companies. I hope that he means it.

Many regions of the country, most notably the agricultural states in the U.S., have suffered economic hardship in recent years—first because of drought and now because of low commodity prices. No American should be subject to price gouging by those who control the retail price of gas, but states like North Dakota are particularly vulnerable to unjustified increases in the price of petroleum products.

This senator will be watching this issue very closely, and I urge the Administration to take all reasonable and necessary steps to guard against price gouging during this period.

PREPARED STATEMENT OF HON. HOWELL T. HEFLIN, U.S. SENATOR FROM ALABAMA

Mr. Chairman, I am delighted that we are holding this hearing today. Unfortunately, it was triggered by the Iraqi invasion of Kuwait on August 2, 1990. With over 60% of the world's proven oil reserves in the Persian Gulf, it is very easy to understand what our strategic interests are in this region of the world.

More importantly, Mr. Chairman, our focus needs to be on the need to develop a national energy policy with respect to this oil crisis arising out of the Persian Gulf turmoil. How is this nation going to deal adequately with the near-term, mid-term, and long-term world oil supply? We do not know what the role of the United States government will be in either one of these three situations.

Mr. Chairman, it appears that this nation is headed toward a recession. Sharp increases in oil prices—from about \$18 per barrel to about \$34 per barrel since the Iraqi invasion of Kuwait—have significantly weakened our national economy. We were already in a slow-growth mode when the shock of the Persian Gulf crisis hit us hard. Now, these soaring oil prices are adding to inflation and making our economic outlook more and more gloomy.

Many of my constituents in the state of Alabama, have complained bitterly about escalating gas prices at the pumps. I have written to United States Attorney General Thornberg asking him to investigate the possibility of anti-trust violations by the oil companies. I have also written a letter to the chairman of the Federal Trade Commission urging her to conduct an investigation into any alleged unfair trade practices arising out of gas price hikes.

Mr. Chairman, I sincerely hope that the oil companies are not gouging the consumers. If they are, and if they show profits during these lean, mean times, then Congress will surely have to come up with a swift, appropriate response.

I know that anti-gouging legislation was recently introduced in both the House and the Senate. It would impose civil and criminal penalties on persons convicted of "profiteering" in times of national emergency.

Mr. Chairman, I believe that this Committee should make a recommendation or issue a statement either supporting or opposing this legislation. Thank you.

PREPARED STATEMENT OF HON. JOHN D. ROCKEFELLER IV, U.S. SENATOR FROM WEST VIRGINIA

I am pleased to have this opportunity to hear from the Administration regarding our energy supply situation in light of the very grave developments in the Middle East.

In many respects the President's handling of the situation has been commendable, and we all support the effort to restore the rule of law to the region.

Nevertheless, the crisis also highlights the record of the past decade in which energy policy was dismantled and we were left vulnerable to the present danger. The Administration sought through budget cuts and administrative means to dis-

card conservation measures, renewable energy programs, fossil energy research, and other energy security programs. Oil industry megamergers met little or no scrutiny and antitrust enforcement was virtually abandoned.

I hope all that is now an artifact of an old, discredited approach. It should now be obvious to everyone that those who argued that the old approach was the cheap approach were wrong. The bills are coming due and the price of that old approach turned out to be very steep.

I look forward to hearing the Administration, with the hope that it is taking a new approach and has new plans for an aggressive energy policy. Some of us in Congress have been pushing for a long time for a genuine energy policy. We have been pushing for alternative fuels and conservation and more. It is time to extricate this nation from the vulnerability produced by a decade of no energy policy.

PREPARED STATEMENT OF HON. JAMES A. MCCLURE, U.S. SENATOR FROM IDAHO

I want to commend Senator Johnston for holding this oversight hearing on the consequences of the Middle Eastern crisis for our oil supply.

While no commodity is more essential to a modern society than energy, it is largely taken for granted—that is until we are told that we may have to do with less or pay higher prices.

Although it is too early to determine the full impact of the current supply shortfall—in part because we do not know how serious the situation may get—it is already having significant economic, military and geopolitical consequences.

It is entirely regrettable that we hold these hearings and begin to think about taking action only after a crisis has begun, rather than before it occurs. That is what happened in 1973 and 1979, and it is happening again today. Policy formulated in the heat of the moment rarely achieves the necessary objectives in the most effective and efficient way; it is dictated more by political imperatives than by rational analysis.

Apart from the price impact already being felt at the pump, if the lost Iraq/Kuwait production is not made up by increased production elsewhere—and made up quickly—the actual supply impact will increasingly be felt this fall as we go into the winter heating season. In this connection I should note that the DOE daily Situation Report for September 11 reports that only 1 million of the 4.3 million barrel per day Iraq/Kuwait oil supply loss has been made up through increased production elsewhere.

Moreover, it is critical to note that the production increases that are being made by Saudi Arabia and others to help offset the shortfall completely exhaust all of the world's near-term spare oil production capacity. Unforeseen events—be they a war-induced reduction in Middle Eastern production, or an Iraqi terrorist-caused supply disruption, or even simple accidents which reduce production—could not be compensated for by increased production elsewhere. Such spare production no longer exists. Significant supply shortfalls and price increases would necessarily result if any of those events occur.

We should view Iraq's August 2 invasion of Kuwait like the recent California earthquake: it is just a warning of the BIG ONE that has yet to come. While Iraq and Kuwait account for a significant share of the free world's oil supplies, Persian Gulf countries altogether account for 38 percent of the free world's oil supplies.

Here in the United States our energy security is increasingly at risk through our growing foreign dependency. In 1973, the year of the Arab oil embargo, the United States was 36 percent dependent on imported oil; in 1979, the year of the Iranian revolution, we were 46 percent foreign dependent; this year we are about 50 percent dependent; and all predictions are that in just a few years we will be two-thirds foreign dependent.

In large part this is occurring because U.S. crude oil production is falling, down 23 percent since 1973. Excluding Alaskan oil, lower-48 oil production has fallen by a whopping 39 percent since 1973, and there is no question that without action it will continue in that direction. Thus, while we need to attend to the current situation, we must not lose sight of the longer-term erosion in U.S. production.

Without comprehensive action to address our broader energy problems, our future situation can be boiled down to a few "facts of life":

- First, our energy consumption will increase along with economic growth.
- Second, U.S. oil production will continue to decline, just as it has for the past two decades.

- Third, we will fail to adequately consider the energy implications of environmental actions; actions which both reduce domestic energy production and decrease

the efficiency by which it is used—for example, the Clean Air Act amendments currently making their way through Congress, and the failure to allow oil and gas exploration and development in many regions of the OCS.

—Fourth, our foreign energy dependency and vulnerability will continue to increase, both in terms of gross percentage as well as with respect to fuel flexibility.

—Fifth, we will further delay development of alternative forms of energy, particularly nuclear power, which could help lessen our dependency.

—Sixth, there is every reason to believe that there could be a really significant oil supply disruption before the 1990s are over, possibly even as soon as tomorrow if we get into a shooting war with Iraq.

—Seventh, with the exception of the SPR we will be no better prepared for the political and economic consequences of a major disruption than we were back in the 1970s.

—Eighth, if a major disruption does take place, it will likely have consequences on our economy and society just as severe—if not more so—than those which occurred as a result of the 1973 Arab oil embargo and the 1979 Iranian revolution.

—And finally, our long-term need for energy at reasonable prices will increasingly make this Nation hostage to the good will of foreign producers.

There is no real dispute about these “facts”; the only question is what, if anything, we are going to do to change them.

Now some believe that it is all right to shutdown operable nuclear powerplants and even oppose research and development into new nuclear power technology; others believe that it is OK to impose offshore leasing and production moratoria; others are comfortable imposing new environmental requirements which not only constrain future energy development, but also may close existing energy production facilities including refineries; and still others are willing to shut down the clean coal technology program because they oppose the burning of coal under any circumstances.

In this Senator's mind it is only too obvious that these views are short-sighted, and that instead we ought to promote all forms of domestic energy production, undertaken in an environmentally responsible manner, in order to stabilize and hopefully even begin to reduce our foreign dependence. Thus I am very pleased that President Bush, in his Tuesday speech to Congress, noted the need to take action to promote all forms of domestic energy production.

If we had done so in the past, we might not be here today; but we didn't. Thus it is because of our failure to pay the insurance premium necessary to protect against supply shortfalls, that we must now bear the cost of the present Middle Eastern crisis—a cost which ultimately may not only be expressed in terms of dollars and cents, but also in terms of killed and wounded.

In closing let me say that there is one thing that we must not do: that is to use the Strategic Petroleum Reserve to manage or manipulate the price of oil, as some are now urging. The reserve must be preserved for the purposes for which it was originally intended, that of responding to severe interruptions of oil supplies and to avoid physical shortages—and not be used as the means to achieve a politically-determined desired price for oil.

Mr. Secretary, I am pleased that you are here today and can give the Committee your views as to what can and will be done to address our precarious energy situation.

PREPARED STATEMENT OF HON. FRANK H. MURKOWSKI, U.S. SENATOR FROM ALASKA

Mr. Chairman, many reasons have been offered as to why America has taken a military position in Saudi Arabia. The answer is simple. We are in Saudi because America is overly dependent on Middle Eastern oil. Defense spending as a result of Operation Desert Shield are projected to reach \$2.5 billion by the end of September. We have committed 100,000 troops and approximately 40 naval vessels to the Persian Gulf. This commitment is necessary to protect access to the vast oil reserves in the Persian Gulf and to keep the oil flowing to the free world. Mr. Chairman, this is unacceptable.

It is unacceptable because when Congress has had the opportunity in the past to improve our domestic energy security we have failed miserably. Particularly disturbing to me is the fact that Congress has had the opportunity to allow exploration and development of an area with as much oil and gas potential as ANWR and has failed to act. It is to this committee's credit that we have reported a responsible bill that will allow us to determine the potential reserves under the Arctic coastal plain.

ANWR is not the only answer by any means. Our domestic energy security requires the adoption of a range of actions including energy conservation, long-term development of alternative energy sources, and exploration and development of America's important oil reserves. When America is 50% dependent on imported oil, as we are now, we must, in the interest of National Security, force actions to reduce our energy dependency. We must avoid future military action to protect the oil reserves of another country. For these reasons, I offered the National Emergency Energy Security Act of 1990 as an amendment to the Dept. of Defense Authorization Bill.

Our country needs to take positive actions to reduce our dependence on foreign oil. A crisis situation like we have in the Persian Gulf helps sharpen our national vision on issues that would otherwise be difficult to define. My amendment is the only energy security action taken by either house of Congress since the Iraqi invasion of Kuwait. The Emergency Energy Security Act acknowledges that our current dependence on foreign oil put us in a vulnerable position as witnessed by our current involvement in the Persian Gulf. Our current situation demonstrates that when the U.S. is at 50% dependence on foreign oil imports we are compelled to respond to threats against our foreign oil supply.

My proposal will work in concert with the National Energy Strategy being prepared by the Department of Energy for early 1991. It would force Congress to take action in accordance with the priorities the National Energy Strategy during a time of energy crisis by requiring the President to forward an Action Plan to Congress. Presidential actions recommended in the Act's Action Plan would be debatable and amendable, and it must be enacted by joint resolution of Congress. This requires the President and Congress to make hard, but important decisions. The Act offers a balanced approach to reducing oil imports by requiring both energy conservation and increased domestic energy production.

Mr. Chairman, thank you for holding this important hearing today. I look forward to the testimony of the Secretary of Energy.

PREPARED STATEMENT OF HON. DON NICKLES, U.S. SENATOR FROM OKLAHOMA

Mr. Chairman, this is an extremely important hearing, particularly following the president's address to the Joint Session of Congress on Tuesday night in which he requested the Congress to enact measures to increase domestic energy production and energy conservation. The invasion of Kuwait by Iraq has reminded the public of the importance of energy security as a critical national priority after a decade of increasing complacency caused by steadily decreasing world oil prices.

We are fortunate that we can have this hearing in a relatively calm setting. We are not in a shooting war, and for the moment, there are adequate oil supplies. We have an opportunity to act on measures which several of us on this committee, including the Chairman and Ranking Republican, have been seeking. We should revisit OCS leasing policies. We should work to secure passage of the committee's bill to open ANWR with abundant environmental safeguards. We should encourage our colleagues on the Finance Committee to report out tax incentives for oil and gas production—particularly for enhanced oil and gas production, and for the independent producer, who find the vast majority of new domestic oil. We should also press our case for a reasonable floor price for crude oil that will encourage investment by preventing the ruinous collapse of oil prices from OPEC overproduction in the future.

We also must be wary of calls for a return to the "command and control" regulation of the 1970's. We must be cautious about any new Synfuels Corporation proposals for alternative fuels, natural gas use restrictions, windfall profit taxes on producers, or attempts to legislate dramatic increases in motor vehicle fuel economy based on the CAFE mechanism. We have learned the painful lessons of those past efforts to repeal the laws of supply and demand and must not repeat them.

I join in welcoming Secretary Watkins and look forward to his testimony.

PREPARED STATEMENT OF HON. CONRAD BURNS, U.S. SENATOR FROM MONTANA

Mr. Chairman, I appreciate your calling this important hearing to begin to sort out the implications of the crisis in the Middle East on our oil supply. Prices are going up. In my state of Montana—although we don't get a drop of oil from the Middle East—prices at the retail pump are among the highest in the United States.

This price increase comes during harvest in our state. Farmers have no choice but to pay higher input costs—they have to get the crop in. But they are unable to pass

the additional costs on. They have to take the loss. There is a saying in agriculture that applies here. The farmer buys retail, sells wholesale and pays the freight both ways. That is the case in this instance. In some areas of my state, small independent jobbers were temporarily rationed fuel.

I have recently returned from the Middle East on a Congressional fact finding mission. While there, I had the opportunity to meet with not only the several heads of state of countries located in the Middle East but also the oil ministers of those oil exporting countries.

In those discussions, I came away convinced that these oil exporting countries will increase their production of oil to make up the shortfall for the loss of Kuwaiti oil. There will be a lag, as these countries gear up. But the additional production is coming.

The promise of additional production from a foreign emirate half a world away is not the solution to our problem however. We are currently dependent upon foreign oil for nearly 50 percent of our oil consumption. We need to wean our country off this dependence on foreign oil.

There are untapped oil reserves in this country. We may need to take a fresh look at reserves in Alaska. And we need to take a closer look at potential reserves in my state of Montana along the Rocky Mountain front. There are some areas within our own country that show promise for new reserves. In addition, there is a large amount of oil in this hemisphere. Closer may be better. But closer isn't the solution.

We need to push ahead toward a national energy policy for this country. I have been supportive of Admiral Watkins and the Department of Energy in their efforts to develop a National Energy Policy. Its taking forever, and I can't get them to come to Montana, but I continue to be supportive.

One of the best kept secrets inside the beltway, is how much clean alternative fuel potential there is in this country. Our farmers have demonstrated their ability to produce clean alternative fuel from agricultural biomass. In addition to agriculture, America's coal reserves would make us energy independent—if they are utilized. Montana alone has 57 percent of the subbituminous and 35 percent of the lignite coal in this country.

If Montana's coal reserves were converted into methanol, there would be enough transportation fuel from our state alone to supply 10 million barrels per day for the next 78 years.

Montana is the Saudi Arabia of coal. And its all right here—not 11,000 miles away. President Bush, in his address to the nation on Tuesday struck a chord when he mentioned the need for alternative fuel and the role that coal could play.

I have been talking about the need for a viable alternative fuels program since I came to the Senate a short two years ago. I will continue to make it a part of my Senate strategy until we begin to make some real changes—a real commitment to a domestic energy policy that includes a viable alternative energy program.

With the will to do it, we can pull together and make substantial progress if we set out goals that everyone can understand and commit to—just as we did with the moon landing in the 1960's. I am ready to roll up my sleeves and begin.

Thank you Mr. Chairman.

PREPARED STATEMENT OF HON. MITCH McCONNELL, U.S. SENATOR FROM KENTUCKY

Thank you, Mr. Chairman for calling this hearing to discuss the Middle Eastern Crisis and its implications for oil supply and U.S. energy policy.

It's high time, Mr. Chairman, that we got serious about developing a comprehensive energy policy for this nation. Secretary Watkins is moving us in that direction, and he is to be applauded for his efforts. Recent events in the Middle East emphasize the need to fashion a policy that maximizes domestic energy sources and minimizes our dependence on foreign oil, and encourage the Secretary to consider this as he develops our policy.

The keys to a successful energy policy are balance and diversification. We must have an energy policy which balances our need for energy independence with the need to protect our environment. And we must have a diversified energy policy which utilizes all the currently available energy sources and which emphasizes research into new, emerging renewable energy sources.

Our national energy policy must include coal, grain-based fuels, oil, natural gas, nuclear, renewable energy sources, and conservation.

Since coal is our most abundant energy source, it must make up the lion's share of our energy mix. Wherever possible, we must replace imported oil with domestic coal. We must continue funding research programs, like the coal liquefaction pro-

gram at the University of Kentucky, to develop new uses for coal. We also need to continue developing technologies under the Clean Coal Technology Program which allow us to increase coal use in this country without compromising the environment.

We must continue to provide incentives for the production of grain-based fuels like ethanol, and we must expand exploration and production of domestic oil and gas wherever it can be done in an environmentally-prudent manner. We are rapidly developing a new generation of nuclear reactors which can provide safe, reliable, clean energy and we need to reexamine the role of nuclear power in our energy mix. Nuclear power will not and should not replace coal as our dominant energy source, but it does have a role.

We must continue funding the development of renewable energy technologies, including solar, wind, and hydro-power. While it is unlikely these energy sources will replace our existing energy sources to any great degree in the short run, they are promising options for diversifying our energy mix. In the long run, our nation will eventually run out of our non-renewable energy like coal and oil. Therefore, other energy technologies must be developed and commercialized for a smooth transition.

Finally, we must learn to use our energy more efficiently. We must curb our appetites for energy. The availability of low cost in this country has been a mixed blessing. While it has fueled unprecedented economic growth, it has also provided a disincentive to conserve. This has contributed to our dependence on foreign oil. The federal government has a role in encouraging energy conservation, but individual Americans also have a responsibility. We must all examine our lifestyles and identify those areas where we can reduce the consumption of energy.

We must move quickly to establish a comprehensive energy policy. Without one, we will remain vulnerable to the whims of radical Arab dictators like Saddam Hussein of Iraq and to the political volatility of the Middle East. This hearing is a step in that direction and I look forward to what our witnesses have to say.

STATEMENT OF HON. JAMES D. WATKINS, SECRETARY, DEPARTMENT OF ENERGY, ACCOMPANIED BY HON. W. HENSON MOORE, DEPUTY SECRETARY, DEPARTMENT OF ENERGY

Secretary WATKINS. Thank you very much, Mr. Chairman. I am honored, as always, to be before this committee and particularly today to share with you our assessment of the current oil market conditions and to discuss with you our energy response measures, including a new set of energy measures just authorized by the President today for me to air at this particular hearing.

The August 2 embargo of Iraqi and Kuwaiti export production, as you know, resulted in a gross loss to the world market of 4.3 million barrels per day of oil. Since then, the market has been supplied by oil on the high seas, by some drawdown of commercial stocks worldwide, and by excess production from Saudi Arabia, United Arab Emirates, Venezuela, United States and many other nations.

The full effects of the oil embargo will not be fully evident until late September because the oil in transit lifted from Iraq or Kuwait prior to the embargo, takes, on the average, 30 days internationally and 45 days to the United States. Those bottoms are essentially being emptied now, and by September 15 all of that oil in the IPSA 2 pipeline will have stopped from those sources. During this time we are closely monitoring the situation, and are in close consultation with our allies and the 21 member states of the International Energy Agency.

Should the situation warrant it, we are prepared to implement a coordinated drawdown of the more than 1 billion barrels in strategic stocks held not only by the United States but by other IEA states as well. The US SPR drawdown capacity is now at 3.5 mil-

lion barrels per day. Other IEA members have a combined capability of 2.0 million barrels per day.

It is of interest, I think, Mr. Chairman, to recognize also that many months ago we decided to run the most aggressive paper drawdown of the SPR that we have run to date. We brought together all the crude oil industry majors and the media to Houston, Texas, went through the various procedures that we follow. We had tremendous interest by them. In October (if in fact the actual drawdown is not required), we will continue with that process. But I think, again, it will expedite our efficiencies in exercising a wet draw if that is required under this situation that we now face.

So I feel comfortable that we have our checkoff list in mind, we have our procedures set up, and we have the coordination with private industry ready to go.

One thing I hope we would get in the Defense Production Act amendments coming out of Congress at the end of this month, is some ability on my part to call my own reserve, if you will, at least in selected ways to free some of the best minds in the oil and gas industry to help in this situation. We could go into an SPR draw with the very best advice without fear of any attacks on the reserves for antitrust or ethics violations.

That reauthorization is one of the measures that I hope will move expeditiously through the Congress. That particular provision, I think, is of interest to this committee—to give me that flexibility.

Coordination is key to strategic stocks drawdown. The world oil market is highly integrated, and, as a consequence, strategic stocks placed into the market by one IEA Nation will benefit all. Since benefits are shared, so should be the responsibility for use of strategic stocks. The principle of sharing is appropriate and consistent with the President's Middle Eastern policy.

The Iraq-Kuwait embargo took place coincidentally at a time when world oil stocks were at very high levels. This is because of the overproduction by OPEC. In the United States, for example, crude stocks in late July were about 50 million barrels above last year's level and 92 million barrels above minimum operating inventory.

Now to give you some benchmark of how the picture looks now, the current crude oil stocks are 76 million barrels above minimum operating inventory and still well above levels at the same time last year. That is the good news worldwide. We are fortunate to be in that posture, particularly as we now face the conversion of our refineries to the winter season products.

Gasoline stocks are tight but adequate. We got through the Labor Day weekend, and that really is the turning point out there in the industry. While it is still tight, they seem to be adequate.

Distillate stocks are above normal.

Propane stocks are 11 percent below last year's level but have risen to approximately 3 percent below last year's level just recently. That is a worrisome thing as we face winter. As you know, we had a shortage last year, and we have jacked up our own involvement in the Energy Department on both heating oil and propane stocks to better facilitate the management of that without injecting ourselves into the private sector responsibility. I think you will find

that this year at least we will have it under management control, but it still, under the circumstances which we face, is of concern as we face the winter season.

I would ask that my entire statement be entered into the record, Mr. Chairman.

Now I included in my statement a whole section on the refinery situation. Because of the time here I am going to skip that and answer questions that come up in questions and answers with the committee.

I would like now to shift to my first chart that I brought here, to talk a little bit about the international ramifications of the 4.3-million-barrels-per-day shortfall. This is a 9 percent shortfall in the worldwide production of oil.

On this chart, on the ordinate there are millions of barrels per day. As a function of time, starting in July 1990 through March of 1991, is the critical period of time as the delays in the delivery process now begin to push this air bubble of 4.3 million barrels per day in through the system.

This chart is derived from worldwide stock inventory knowledge coming out of the IEA and our own data and is decreased by the amount of 500,000 barrels per day that represent what \$25 per barrel per day does to the world market itself, just in itself. It also reflects the ramp-up of the production capacity of Saudi Arabia, UAE, Venezuela, the United States and other nations. We have the best information available coming out of our Energy Information Administration that tells us exactly when this production is not only going to come on line, but reach the marketplace.

So we have the delays in the system of getting to the market the 2 million additional barrels on line in Saudi, the 0.5 million barrels per day in the UAE, the 0.5 million barrels per day in Venezuela and then the nominal 0.5 million coming in from other sources.

What is not shown in this chart is the impact of conservation and efficiency measures which all of the IEA nations have been challenged to execute. One of the key elements that I will not talk about in detail today are those additional measures which we are announcing today over and above the four measures that we announced as our near-term, first out-of-the-box initiative the middle of last August.

You see in this period of time, therefore, an ability if we can conserve and make our energy use more efficient, to squash those standpipes down and bring it back to the zero level or the nominal level that we found before the conflict started. This, then, represents the challenge to us and really is the mechanism we are watching that might trigger off an international coordinated stock drawdown of the SPR.

By the way, I hope you on the dais have all been provided copies of these.

So then as I go into the next two charts, I would like to set them up by saying that we have been working for the last 3 weeks in an interagency group, the Economic Policy Council, with the White House staff and the other agencies in Government, to put together this next set of initiatives. More importantly, we brought in members from industry, consumers; we had the State energy officers in the other day from every State; the governors' representatives; to-

morrow NARUC will be in; and the utility commissioners. We are bouncing all of our thoughts off of them so that what we are saying here we believe is substantive.

We believe the data we have is not padded in any way but, rather, realistically looks at what can be done in the United States to do our share of both conserving oil as well as the oil production enhancement that the President has challenged us to do both in the August 8 address to the Nation as well as the address to the joint session of Congress and the other night.

Let me take efficiency measures first, because I think these are extremely important in this particular event.

On the left are the energy response initiatives that we are talking about, which include both the near-term initiatives announced on August 15 and the additional initiatives that we are announcing today. On the right is the result of that. In other words, the Nation consumes somewhere around 17.5 million barrels per day, as you can see on the ordinate of the chart there.

As a function of time through December 1991, the upper chart tells you the projection of what would have happened had we not had this crisis in all probability. These are the best projections that we can come up with from Treasury, Transportation, ourselves and the other agencies that worked this problem.

On the green line is the decline in consumption as a result of a price effect of \$25. That is the nominal response that we would see from the market.

So the differential between the green curve and the bottom blue curve, for example, will be the result of the initiatives we have outlined on the left.

We have already announced the tire pressure initiative. We probably overplayed that. We initially said it was 100,000 barrels per day. We now believe that it is 50,000 barrels per day.

The car pooling and van pooling and the compliance with speed limit were ones that we had announced earlier, and those figures, I think, are well analyzed. There is no one now who believes that we have overplayed the part of these conservation techniques, and, therefore, we are very serious about them. We do not think they are trivial.

In addition, today we are seeing utility and industrial conversion issues, use of lower octane gasoline—that ping you hear is the price of freedom, that kind of thing.

The oil burner tuneup/replacement is very important as we face the winter season.

Use of the more efficient car in the family was announced earlier.

The President will be issuing shortly an executive order to bring all Federal Government agencies fully within the energy efficiency envelope that we all want, only it will be on an accelerated basis, including: the use of gasohol where distribution facilities are now available, which does not require altering the vehicle; the alternative-fuel automobile—we will be announcing today the acquisition of 65 new vehicles for the Federal Government, but that will have to be accelerated; and many other broader initiatives on energy efficiency to do all that we can within the Government to set a model in the Nation for oil backout. We believe that is very impor-

tant, and that is among the initiatives we will be announcing today.

Now let us shift to the last set of charts. We have talked about energy measures that are new. There are 14 new initiatives being announced today in addition to the 8 we had the other day, so we think we are under way well within all of the mechanisms that we have available to us at this time, including help from the Congress on certain pieces of legislation that we will be talking about in just a minute.

This set of charts here tells us what we can do in the United States to contribute to the world oil supply stocks. This is the same kind of analysis that has been going on in all 21 members of the International Energy Agency.

On the right you see the ability to enhance production of the United States (which is now around 7 million barrels per day) by a variety of techniques.

The free market at \$25 per barrel will automatically enhance some production but significant production will not come until investors believe there is going to be some stability in that market price.

It does have an impact. We are seeing the number of active oil rigs, for example, now beginning to grow again above the 1,000 level. We are beginning to see seismic crews being assembled now, more interest in petroleum engineering in the universities and that sort of thing. The stock market itself will drive that incentive.

So that is the impact of the green line from what you might say is the bottom normal line. The base level is on the bottom there, but we are trying to build up and enhance our oil production capacity on this curve.

The differential, then, between the green line which is the market-oriented increase in oil production and the blue line is the result of the various initiatives you see outlined here for the crude oil production and fuel switching.

Now in that particular case, eight of these are new. We did not have the new Alaska production in Niakuk and Point McIntyre. We believe that is a very solid one to put in there at 100,000 barrels per day.

The California heavy oil production is a very good one.

Point Arguello was announced earlier. We have shifted that more into mid-term because it looks like that dispute will not be resolved until the end of the first quarter of calendar year 1991. We are very hopeful that, between Chevron and Santa Barbara County, the ability to move that oil from its current terminal at Point Arguello into the refinery system either by ship in the interim period, or by pipeline in the long term, will all be resolved. That is very important.

Increased State allowances: we had a very fine meeting of the various States involved in allowables that did, except for East Texas, give a several-month reprieve on allowables, which gives us another 20,000 to 30,000 barrels per day.

The Naval Petroleum Reserve production has increased 5,000 barrels per day.

Utility and industry fuel switching is new. We believe this is one of the most important and potentially significant areas in the

entire area. Not only is it good for this particular situation, it is good for environment, it is good for economy, and it is good for consumers.

This is going to be the focal point of a lot of our efforts in the near term—to move some 37 projects in gas pipelines that are sitting in FERC now, overwhelming them. We believe some regulatory change is necessary, and we are going to try to impact on that rulemaking. But we also believe that we may need legislative assistance in a couple of areas to help Martin Allday over there and FERC, to at least in the near-term period, move some of these more significant pipeline access projects into fruition. Let us come to grips with it and get this fuel switching going so we can begin to use natural gas in lieu of oil and backout more oil.

Now in that regard, one of the pieces of legislation being considered here is the Clean Air Act section on the *WEPCO* decision. That *WEPCO* decision is critical to fuel switching. We cannot disallow, in my opinion, a utility that desires to shift to natural gas, say, from oil to carry a heavy burden of “new start” problems that would be levied on them unless we clean up the *WEPCO* decision.

Now the Senate version of the cleanup of that in the Clean Air Act I think is excellent. We have to try to hold the line on that. The Administration has sent over a modification to that and taken a strong position now on *WEPCO* that we feel is essential. I would say that, consistent with the President’s announcement the other night that we need some near-term measures passed this session of Congress, the *WEPCO* decision is essential.

If we do not get a clean air bill with it in there, we should pluck that element out and move it separately on some other bill. It is that critical to fuel switching and to energy utilization.

Now lastly in closing, before I open myself up to questions, I would just briefly like to go back to my testimony that you have and talk about what I consider to be the key examples of pieces of legislation that can help us this year.

Incentives for domestic oil and gas exploration—and Secretary Moore can elaborate on this more. But for 2 consecutive years the President has proposed to Congress in his annual budget these four tax incentives. They primarily enhance the ability of our independent producers to explore more, to invest more, and to preclude the close-out of so many of the wells that we now see closed out nationally, which is a tragedy in my opinion. So they need help. And now is the time, it seems to me, to lay the foundation for some kind of incentives so that we do not lose that tremendous 53 percent of our oil input in this country. And so they are outlined in my statement.

I think the *WEPCO* decision that I have already touched upon is very critical. And let me say that there are a few other things that I do not mention in my statement that are very critical.

I mentioned earlier in my opening remarks that it is important that I have some executive reserve callup authority that exempts the resolve from the ethics and problems in antitrust that might be levied on them in the advisory role to me. That is an issue that is under the Defense Production Act.

I believe it is all moving properly through. We have to reauthorize that act by the end of this month. But I just caution this com-

mittee to watch that and make sure that it moves through. Or if it cannot, pluck it out and let us move it separately.

These are the kinds of things that I think are very important right now. There is another one in the Clean Air bill that is very critical. It is a little known portion of it called radionuclides. And if the wrong twist is put on the radionuclide provision of the Clean Air Act, and we have constraints along the lines that I am afraid will creep back in again if we do not watch it carefully, we will lose the future of nuclear power in this country. And I do not believe this is the time to throw out that particular option.

We are also working the Shoreham issue, continuing to do that through the Appeals Court in New York with the support of the Justice Department. And we will be working with the Nuclear Regulatory Commission, under the circumstances we face in the world today, to demand an environmental impact statement so we can look at the alternatives to that 21,000-barrel-a-day equivalent plant that was fully licensed, running at 5 percent power for 2 years and closed out. And that is about the size and equivalency of the Iroquois pipeline.

So I just do not understand how we can allow that resource to casually disappear. And certainly, we are going to keep fighting that. But under any circumstances we need a very thoughtful radionuclide provision to come in that Clean Air Act along the lines presented by Senator Simpson in the final days of the Senate passage of that act.

With those brief remarks and with the ability to enter my full statement in the record, Mr. Chairman, I will open myself up to questions.

[The prepared statement of Secretary Watkins follows:]

PREPARED STATEMENT OF HON. JAMES D. WATKINS, SECRETARY, DEPARTMENT OF ENERGY

Mr. Chairman and members of the Committee, I am pleased to be able to share with you our assessment of current oil market conditions, and to discuss with you the energy measures that the Administration is undertaking in response to the Middle East situation.

The August 2 embargo of Iraqi and Kuwaiti export production resulted in a loss to the world market of 4.3 million barrels per day of oil. Since then, the market has been supplied by oil on the high seas, by some drawdown of commercial stocks, and by excess production from Saudi Arabia, the United Arab Emirates, Venezuela, and others.

While the full effects of the oil embargo will not be fully evident until late September (because of oil in transit lifted from Iraq or Kuwait prior to the embargo), we view the current market as relatively stable, but uncertain about future supply. We are closely monitoring the situation, and are in close consultations with our allies and with the member-states of the International Energy Agency (IEA). Should the situation warrant it, we are prepared to implement a coordinated drawdown of the more than 1 billion barrels in strategic stocks held by the U.S. and by other IEA states. The U.S. SPR drawdown capacity is 3.5 million barrels/day. Other IEA members have combined capability of 2.0 million barrels/day.

Coordination is key to strategic stocks drawdown. The world oil market is highly integrated, and as a consequence, strategic stocks placed into the market by one IEA nation will benefit all. Since benefits are shared, so should be the responsibility for use of strategic stocks. This principle is appropriate and consistent with the President's Middle Eastern policy.

The Iraq-Kuwait embargo took place coincidentally at a time when world oil stocks were at very high levels. In the United States, crude stocks in late July were about 50 million barrels above last year's level, and 92 million barrels above minimum operating inventory.

Currently, U.S. crude oil stocks are 76 million barrels above minimum operating inventory, and well above levels at the same time last year. Gasoline stocks are tight, but adequate. Distillate stocks are above normal. Propane stocks were 11.5 percent below last year's June level, but have risen to approximately 3% below last year's level.

We are very concerned about the ability of refiners to continue operating at near maximum capacity for an extended period of time. We are more vulnerable to events such as refinery accidents, transportation problems, or bad weather. World-wide refining capacity declined by 10% over the past decade, with a disproportionate share of the capacity reductions occurring in the United States and Western Europe.

Consultations with industry and analysis of market information suggest that the problem, in the short term, is not refining capacity, but the quality of available crude oil and the distribution of supplies. In general, the crude oil production coming on line to replace the lost Iraq and Kuwait production is expected to be of lower quality.

Worldwide, excess production capacity is available to offset the shut-off of Iraqi-Kuwaiti export production. A substantial part of this excess capacity has been brought on line, but is insufficient to fully offset the shortfall. For this reason, the United States and its allies are taking steps to mitigate the effects of the embargo by facilitating production of indigenous supplies, by encouraging efficiency, and by maximizing fuel switching.

The Administration on August 15 announced a first set of short-term measures aimed at reducing reliance on oil imports in the last quarter of 1990. These measures include: increased Prudhoe Bay production; mediation of a dispute between producers and California authorities over commencement of production at Pt. Arguello, off Santa Barbara; a request to Texas and other States to increase allowable production in some fields; and a slight increase in production from Elk Hills Naval Petroleum Reserve. With the exception of Pt. Arguello, which cannot be brought into production this year, most of these increases have been pledged or achieved.

On the demand side, we will this week launch a National campaign, under the sponsorship of the Advertising Council, aimed at encouraging consumers to use energy more efficiently. This initiative will seek the cooperation of consumers to take modest individual steps that will collectively have a meaningful impact on oil consumption; that will reduce energy costs to consumers, and that, in some cases, will likely save lives. I have also directed the Department of Energy and its contractors to undertake all feasible action to reduce oil consumption, switch to other fuels, and increase use of alternative fuels.

Mr. Chairman, on Tuesday evening the President called on Congress to enact, this month, legislative measures that would serve the national interest by reducing our dependence on foreign oil. These measures include:

Incentives for Domestic Oil and Gas Exploration.—The Administration has included in the budget for the last two fiscal years a temporary tax credit for new enhanced oil recovery projects and for exploratory drilling expenditures; elimination of the transfer rule; an increase in the percentage depletion net income limitation; and a larger deduction from income for alternative minimum tax purposes of exploratory drilling costs incurred by independent producers.

Accelerating the Development of Alaskan Energy Resources, Without Damage to Wildlife.—The Coastal Plain of the Arctic National Wildlife Refuge should be explored, and if significant resources are found, it should be developed without damage to wildlife. In March of 1989, this Committee approved a bill authorizing exploration and development of ANWR. Similar legislation was introduced in the House. The time has come to move forward on ANWR in an environmentally sound manner acceptable to both Congress and the Administration.

In addition, we have asked the Congress to take action on:

Impact of WEPCO on Fuel Switching.—The results of the WEPCO decision must be addressed legislatively if we are to benefit from the maximum achievable and cost effective conversion from oil to other fuels, including natural gas. The Administration has submitted to Congress a provision to deal with this issue in the context of the Clear Air Act amendments. It is important that Congress act on this proposal, either within the context of the Clean Air Act amendments or as a separate issue.

PURPA Size Limitations.—The Administration supports the removal of size limitations on renewable energy technologies contained in the Public Utility Regulatory Policy Act. The House and Senate have passed different versions of this legislation in different bills. We are prepared to work with Congress to promptly complete action on this legislation.

Title II of the 1990 National Energy Policy Act.—The Administration supports key provisions of this Title, including those related to home energy efficiency ratings, and utility provision of energy efficiency services. We are prepared to work with Congress in a spirit of compromise to find common ground in support of this Title's main objectives.

We are announcing today a package of medium-term measures to obtain further increases in oil supplies, greater efficiency, and more fuel switching over the next 18 to 24 months. These measures include: expedited action on Alaska oil projects; removing barriers to California heavy oil production; facilitating the construction of natural gas pipeline projects; technical assistance for waste-to-energy plants; accelerated use of alternative fuels in the Federal fleet; and low priority dispatching of oil-fired generation.

On the demand side, the measures include: encouraging private, commercial and business consumers to increase efficiency of oil use by purchasing lower octane gasoline; tuning up or replacing oil burners; increasing conservation in oil-dependent utilities; and adopting better driving techniques.

These initiatives are aimed at cutting through a number of regulatory bottlenecks that have prevented reasonable and environmentally beneficial projects from coming on line, and responding to the President's call for conservation.

The President also declared that no one should contemplate profiteering from the Iraqi invasion of Kuwait. Immediately after the invasion, DOE issued a joint statement with the Departments of Justice and Transportation expressing concern over the increase in gasoline prices. DOE will continue to rigorously monitor and report on market trends, and industry pricing actions. The Justice Department is investigating any indication of anti-competitive activity. Such activity will be met with vigorous antitrust prosecution. We are working closely with Justice and will share the results of our analyses with them, as well as with Congress and the American people.

The President noted on Tuesday night, as well as on previous occasions, that "Conservation efforts are essential to keep our energy needs as low as possible." To that end, we intend to set a National example by requiring greater efficiency in Federal energy use. We also intend to illuminate for private and corporate consumers the idea that it is a matter of economic and environmental self-interest to reduce waste and increase efficiency.

Among the medium-term measures that I have mentioned are a few that merit particular attention today. In Alaska, there are several potentially significant oil development projects which would benefit from expedited decision-making in the permitting process. These projects could be producing over 100,000 b/d of oil by the end of 1991. In California, over 13,000 wells, currently shut-in, may be reopened to production if certain gas pipelines can be completed to bring much needed natural gas for enhanced oil recovery. Increased heavy oil production in California can contribute 100,000 B/D or more to the U.S. supply.

Nearly three dozen natural gas pipeline projects are awaiting approval by a variety of Federal and State agencies. These projects, whose approval can be expedited, have the potential of backing out 55,000 b/d of oil by 1991; 300,000 b/d by 1992; and nearly 600,000 b/d by 1994.

We are working actively with the Federal Energy Regulatory Commission to identify those pipeline projects which can provide natural gas to displace oil, and to remove Federal roadblocks to their approval. We are also working the FERC to streamline their procedures for consideration of pipeline projects. In the final analysis, however, it may be necessary to seek statutory changes to insure that required environmental reviews and federal permitting are completed within a reasonable period of time.

Mr. Chairman, this Nation has the material and technical capability to reduce the vulnerabilities inherent in our dependence on insecure supplies of imported oil. The response measures we have been able to define and to promulgate in the last 30 days have been drawn from the important investment we have made in the last year to develop a National Energy Strategy (NES). It has been a fundamental tenet of the NES to craft policy options that respond to the multiple goals of economic productivity, energy security, and environmental quality.

The short and medium term measures I have discussed here today are responsive to those multiple objectives. If fully successful, they will have the effect of reducing our oil import requirements by over 1 million barrels/day of oil equivalent. This is substantially more than U.S. oil imports from Kuwait and Iraq prior to the embargo.

It was in July 1989 that the President directed the Department of Energy to develop the NES in close collaboration with other Federal agencies. Just one year

later, events have brought home the message that energy is an integral part of our economy. We have gathered fresh evidence that no part of the American energy sector can be allowed to deteriorate, or become less than fully productive, or rendered impotent by regulatory deadlock. We must, as the President stated, take advantage of all the energy resources—coal, natural gas, hydro, nuclear, and the full range of renewable technologies, that are available to the nation in part because of the substantial investments we have made in Federal research and development.

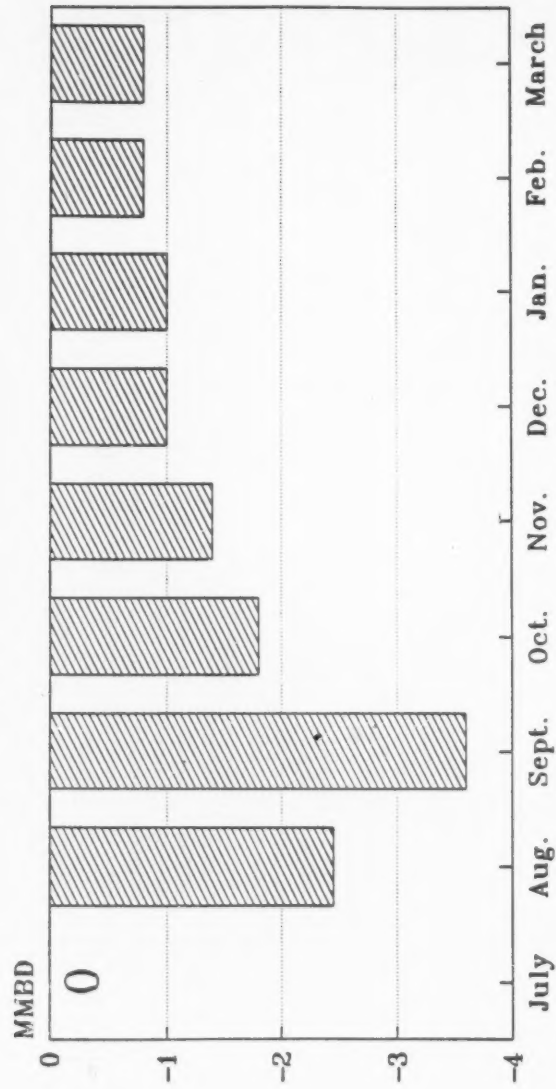
The development of the National Energy Strategy has proven opportune. It has provided a framework for dealing prudently but effectively with the present, unexpected situation. It will prove even more useful for the longer term.

We are on schedule for the completion of the NES. We expect to complete the remaining analytical work by the end of September, and to develop a set of coherent policy options for the President's consideration in December. I would add that the inter-agency process that has been established for the NES has proved effective in engaging the attention and cooperation of the multiple Federal agencies involved in most aspects of energy decision making.

Mr. Chairman, I will close by stating that the current situation in the Middle East offers a number of challenges for the U.S. economy and for the economies of less developed nations, including Eastern Europe. But it will also offer a range of opportunities to craft long-range energy policies grounded in reality and in common sense. The strategic task we set for ourselves in June of 1989 will permit us to make intelligent decisions for the future as it has for the present.

I hope you and the members of this committee will find it possible to support it. This concludes my statement, and I would be happy to answer any questions.

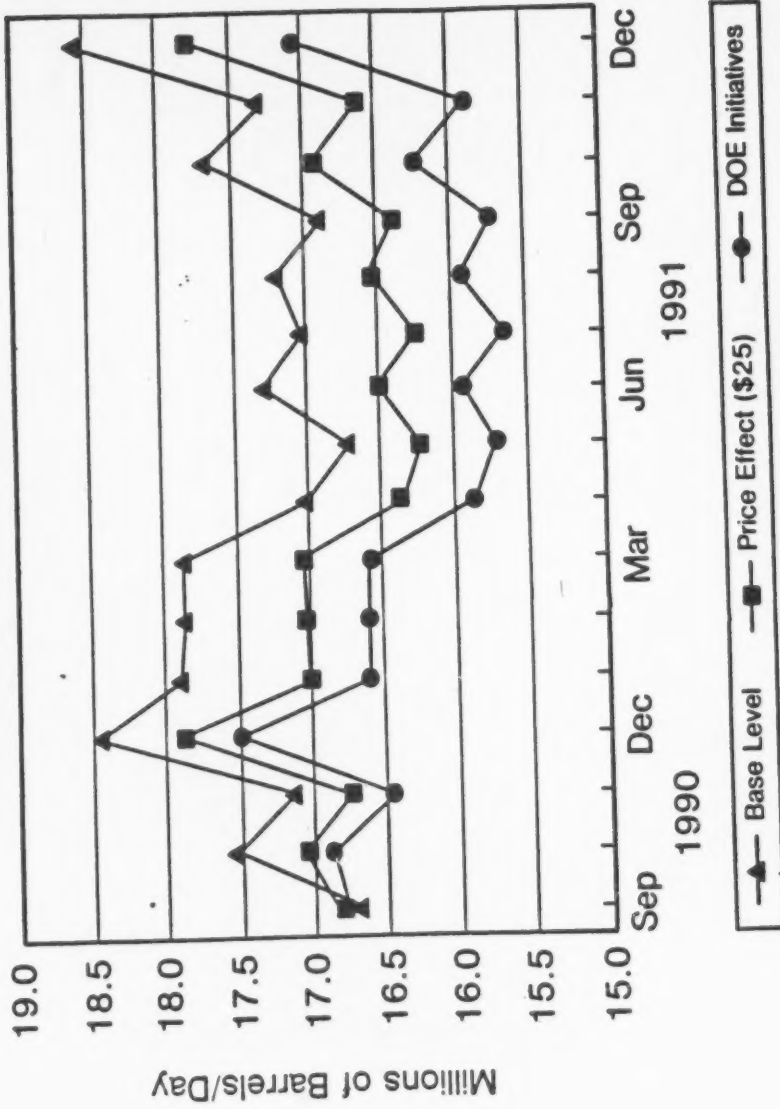
Net Worldwide Petroleum Supply Loss*: 1990-1991



Net Supply Loss

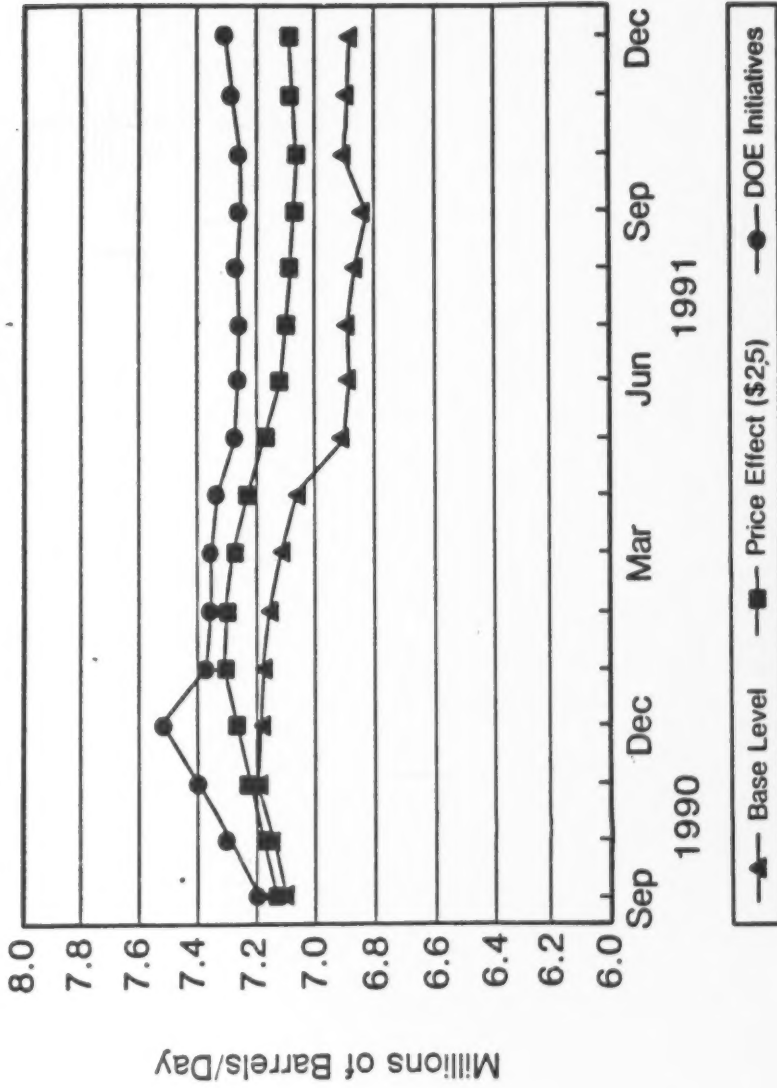
*Average Monthly Loss

U.S. Energy Response Initiatives Efficiency Measures



Source: EIA: Short Term Energy Outlook, April 1990.

U.S. Energy Response Initiatives Crude Oil Production/Fuel Switching



Source: EIA: Short Term Energy Outlook, April 1990.

U.S. Energy Response Initiatives

Crude Oil Production/Fuel Switching

Measure	Goal (By Dec. 1990)
1. Increase Prudhoe Bay Production	100,000 Barrels/Day
2. New Alaska Production (Niakuk, Pt. McIntyre)	100,000
3. California Heavy Oil Production	100,000
4. Pt. Arguello Production	75,000
5. Increase State Allowances	30,000
6. Increase NPR Production	5,000
7. Utility/Industry Fuel Switching	100,000
8. Natural Gas Pipeline Projects	55,000
9. Gasohol Use	10,000
10. President's Oil and Gas Tax Incentives	<u>32,500</u>
	TOTAL: 607,500 Barrels/Day

11-13. Dispatch of Oil Fired Generation,
Accelerated Use of Alternative Fuels,
Waste-to-Energy Permitting

Goal To Be Determined

25% by the end of 1990 90% by the end of 1991

U.S. Energy Response Initiatives

Efficiency Measures

Measure	Goal (By Dec. 1991)
1. Better Driving Techniques	120,000 Barrels/Day
2. Proper Tire Pressure	50,000
3. Car Pool/Van Pool	90,000
4. Utility/Industrial Conservation	75,000
5. Compliance With Speed Limit	50,000
6. Use of Lower Octane Gasoline	50,000
7. Oil Burner Tune Up/Replacement	45,000
8. Use of More Efficient Car	40,000
9. Federal Energy Conservation	10,000
	<u>TOTAL: 530,000 Barrels/Day</u>

80% by the end of 1990

100% by the end of 1991

ADMINISTRATION'S MEDIUM TERM ENERGY MEASURES

ENERGY EFFICIENCY

Encourage Use of Lower Octane Gasoline.—About 80 percent of today's vehicles operate well on 87 octane (regular) gasoline, with no significant effect on engine fuel economy, durability or emissions. If we, as a Nation, cut back on our use of premium gasoline, we can save energy and money. Oil savings goal of 30,000–80,000 b/d by reducing the average octane level from the current 88.5 to 87. Consumers could save on the order of up to \$3 billion per year. DOE in its public awareness campaign will encourage the use of lower octane gasoline.

Encourage Oil Burner Tune-Up and Replacement.—Residential and commercial consumers currently use an average of 900,000 b/d of fuel oil for space heating. Improved maintenance and adjustment of existing equipment can improve efficiency by 10 percent, and save consumers money (paying for itself in less than a year). The replacement of older equipment with more efficient burners, boilers and furnaces, can improve efficiency by 25 percent, and will pay for itself in 1–5 years. Oil savings goal of 35,000–50,000 b/d. DOE will work with petroleum marketers and States, and in its public awareness campaign will encourage oil burner tune-up and replacement.

Encourage Better Driving Habits.—The average driver can improve gas mileage by 15% by following the advice of the Federal Driver Energy Conservation Awareness Techniques (DECAT) program. Some private operators of large vehicle fleets have successfully adopted the DECAT program. Oil savings goal of 70,000 b/d in personal transportation, and 50,000 b/d in commercial transportation. The Department of Energy and the Department of Transportation will make DECAT material widely available to fleet operators, State energy offices, and consumer organizations.

Encourage Electricity Conservation.—Twenty-nine U.S. utilities, principally in the Northeast and Mid-Atlantic States, account for 94 percent of the 650,000 b/d of oil used for electricity generation. Every 1 percent reduction in electricity consumption reduces energy inputs to these utilities by the equivalent of 150,000 b/d of oil. DOE will work with utilities and State public Utility Commissions to encourage consumer energy efficiency.

Encourage Industrial Oil Conservation.—Manufacturing accounts for 25 percent of U.S. oil consumption, a substantial amount of which is used for feedstock. A 1 percent reduction in oil use by manufacturers would save 36,000 b/d of oil. DOE will work with leaders in the manufacturing community to provide information on energy efficiency opportunities and make energy efficiency a higher management priority.

Increase Federal Government Energy Efficiency.—The President will issue an Executive Order directing Federal agencies to increase energy efficiency in new construction and in existing installations.

FUEL SWITCHING, ALTERNATIVE FUELS, AND OIL BACK-OUT

Expedite Processing of Natural Gas Pipeline Projects.—A substantial capability for fuel switching exists in the U.S., particularly from oil to natural gas. A number of natural gas pipeline construction projects are awaiting Federal and State permitting decisions. Pipeline projects with service dates of 1990–1991, if completed, would displace 55,000 b/d of oil. Other projects due for completion by 1994 would displace 595,000 b/d of oil. DOE will work with FERC to develop procedures to expedite the processing of various natural gas projects. In addition, DOE intends to develop legislative proposals to remove barriers to entry and facilitate permitting of needed natural gas facilities.

Minimize Dispatching of Oil-Generated Electricity.—The utility industry consumes about 650,000 b/d of oil for power generation, mostly for peak power production. DOE will work with FERC, State regulators and other non-government electric power regulatory organizations to determine the feasibility of minimizing the dispatching of oil-generated power.

Accelerate Conversion of the Federal Fleet to Alternative Fuels.—The Federal Government would accelerate its purchase of, and conversion to, alternative fuel vehicles. The vehicles purchased or converted under this initiative would use several alternative fuels, including methanol, ethanol, compressed natural gas, propane, or electricity. The Federal Government purchases 55,000 vehicles per year. As a first step on September 13, 1990, DOE and the General Services Administration (GSA) announced the purchase of 65 alcohol fuel-flexible vehicles to be delivered by January 1991 for use in the Federal fleet. DOE and GSA also agreed to purchase natural gas powered light trucks later this fall.

Accelerate Permitting of Waste-to-Energy Plants.—Two-fifths of the electricity in New England, and more than one-fourth of the electricity in New York and New Jersey is oil generated. Municipal solid waste plants offer a competitive power generation alternative, but encounter a variety of siting and permitting obstacles. Thirteen plants in this region are under construction and an additional twenty-eight are planned. Appropriate Federal agencies would provide technical assistance to local authorities to resolve technical problems and where appropriate to assist the permitting of these plants. Up to 35,000 b/d of oil could be displaced within 3 years.

PETROLEUM SUPPLY OPTIONS

Expedite Permitting for Alaskan Oil Production Projects.—An inter-agency task force will be created to identify Alaska oil production projects that would benefit from expedited processing of Federal permits, taking into account all regulatory, environmental, energy and other policy factors. For example, resolution of permitting problems could result in production of up to 100,000 b/d in 12 to 18 months from two developed fields in Alaska's Beaufort Sea (Niakuk and Point McIntyre). These and other projects will be considered by the task force.

Increase Production of Heavy Oil in California.—About 13,000 oil wells are currently shut-in in California. Action to increase natural gas supplies for steam generation needed to recover heavy oil from these wells could allow production to be undertaken without adverse effects on air quality. The Administration will work with relevant State and Federal authorities to resolve regulatory barriers preventing delivery of natural gas to these areas. A rise in oil production of 50,000 to 100,000 b/d could be achieved in one to two years.

Incentives for Domestic Oil and Gas Exploration.—The Administration has included in the budget for the last two years a temporary tax credit for new enhanced oil recovery projects and for exploratory drilling expenditures; elimination of the transfer rule; an increase in the percentage depletion net income limitation; and a larger deduction from income for Alternative Minimum Tax purposes of exploratory drilling costs by independent producers. These incentives would increase new exploratory drilling, especially by independent producers; would slow the abandonment of marginal wells; and would increase production from aging fields. The combined effect of the incentives is to add an estimated 172,000 to 196,000 b/d by 1995. The Administration will work with Congress to enact these incentives.

Accelerate Development of Alaska Energy Resources, Without Damage to Wildlife.—The coastal plain of the Arctic National Wildlife Refuge (ANWR) should be explored, and if significant resources are found, it should be developed without damage to wildlife. In March 1989, the Senate Committee on Energy and Natural Resources approved a bill authorizing exploration and development of ANWR. Similar legislation was introduced in the House. The Administration will work with Congress to move forward on ANWR in an environmentally sound manner.

U.S. DEPARTMENT OF ENERGY
September 13, 1990

THE SECRETARY OF ENERGY,
Washington, DC, September 13, 1990.

HON. J. BENNETT JOHNSTON,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: Thank you for the opportunity to appear before your committee this morning to discuss the implications of the Persian Gulf situation on petroleum supplies, and the near- and mid-term actions by the Administration to mitigate potential shortfalls.

In our discussion, I referenced provisions in the Senate Clean Air Act designed to provide a fix for problems faced by many electric utility plants due to the WEPCO decision. I misspoke when I indicated that the Bush Administration supports the provisions in the Senate bill. We do not believe that the Senate language adequately addresses the problem. We do support legislative language which was developed in close consultation between DOE, EPA and the Executive Office of the President. This language was forwarded by Richard Schmalensee of the President's Council of Economic Advisors to Chairman Wendell Ford of the Subcommittee on Energy Research and Development on July 23, 1990. I have included another copy, along with more recent questions and answers provided to the subcommittee, for your review.

In addition, DOE has made this position widely known to the Conferees on the Clean Air Conference.

Notwithstanding any confusion my statement might have caused, I strongly believe that an equitable WEPCO fix must be achieved along the lines outlined by Mr. Schmalensee. This is essential to eliminate uncertainty in the electric utility industry which could prevent bringing oil-displacing power production technologies on-line.

I appreciate this opportunity to correct the record of today's hearing.

Sincerely,

JAMES D. WATKINS,
Admiral, U.S. Navy (Retired).

[Enclosure.]

COUNCIL OF ECONOMIC ADVISERS,
EXECUTIVE OFFICE OF THE PRESIDENT,
Washington, DC, July 23, 1990.

HON. WENDELL H. FORD,
Chairman, Subcommittee on Energy Research and Development, Committee on Energy and Natural Resources, U.S. Senate, Washington DC.

DEAR CHAIRMAN FORD: Pursuant to my testimony of May 8, 1990, legislative language that addresses the WEPCO issue is enclosed. The Administration believes that language along these lines would both protect environmental quality and remove the uncertainty surrounding the application of the modification rule to electric utility plants as the electric utility industry makes the physical and operational changes necessary to meet new pollution reduction requirements under the Clean Air Act Amendments now under conference consideration.

Answers to the specific questions raised in your letter of May 18, 1990 will be forthcoming shortly. Please do not hesitate to call on me if I can be of assistance regarding any aspect of this issue.

Sincerely,

RICHARD SCHMALENSEE,
Member of the Council.

[Enclosure.]

PROPOSED WEPCO LANGUAGE

Sec. XXX. APPLICABILITY OF NEW SOURCE REVIEW TO EXISTING ELECTRIC UTILITY STEAM GENERATING UNITS.

(a) Applicability of New Source Performance Standards.—No physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification for purposes of Section 111, provided such change does not increase the maximum hourly emissions of any pollutant regulated under the section above the maximum hourly emissions achievable at that unit during the 5 years prior to the change.

(b) Applicability of Part C of Title I—

(1) Pollution Control Projects.—For purposes of Part C, no physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification of the source for a specific regulated pollutant, provided that the change constitutes a pollution control project at that unit and does not increase maximum hourly emissions of that pollutant above past maximum hourly emissions of that pollutant at that unit; or

(2) Pollution Control Projects with Contemporaneous Changes.—For purposes of Part C, no physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification of the source, for a specific regulated pollutant, provided that the change is part of a pollution control project at that unit and

(A) is accompanied by contemporaneous physical or operational changes to that unit, that do not, exceed 20 percent of the total cost of the project; and

(B) the change does not increase maximum hourly emissions of that pollutant above past maximum hourly emissions of that pollutant. For a unit subject to section 407, immediately following the changes, the unit shall be required to meet the nitrogen oxide emission limitation specified for that boiler type pursuant to section 407. In the event that the change precedes the establishment of nitrogen oxides emissions limitations for that boiler type, pursuant to section 407, the unit shall be required to meet the applicable emission limitation upon the date required by the regulation; (i) for

an existing electric utility steam generating unit not subject to section 407, immediately following the change, the unit shall be required to meet the nitrogen oxide limit equivalent to the limit achievable using "low-NO_x burners."

(3) Except as provided in (b)(2), in the event that the maximum hourly emissions of any regulated pollutant increase, the source is subject to the requirements of subsection (c) for the pollutant.

(c) Nonpollution Control Projects and Pollution Control Projects in Nonattainment Areas.—Except for a unit that is subject to the provisions of subsection (b), no physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification for purposes of Part C or Part D, provided that such change does not result in a significant net increase in representative actual annual emissions of any regulated pollutant at the source in the case of Part C and of any criteria pollutant in the case of Part D.

(d) System-wide Netting—

(1) The operating company may, for purposes of subsection (c) of this section, elect to calculate its representative actual annual emissions (A) on a statewide basis, where EPA is the permit issuing authority in the State and the State agrees, or (B) on a system basis, where EPA is the permitting authority in one or more States in which the operating company owns electric generating units, provided all affected States agree.

(2) Any State permitting authority may allow actual annual emissions in both representative periods to be (A) total operating company emissions within the State, (B) with the agreement of the owners of all other electric generating units with the State, total emissions within the State, or (C) with the agreement of any other States in which the operating company owns electric generating units, total operating company emissions.

(e) Modeling Requirements.—Nothing in this section shall authorize an increase in emissions which causes or contributes to a violation of a national ambient air quality standard, PSD increment, or visibility limitation. Any physical or operational change at a source subject to subsection (b) of this section that results in an increase in representative actual annual emissions of any criteria pollutant over levels used for that source in the most recent air quality impact analysis in the area conducted for the purposes of Title I, if any, which the Administrator determines is reliable, may be required to perform an air quality impact analysis, whenever the Administrator has reason to believe that the increase will cause or contribute to a violation of any ambient standard, PSD increment, or visibility limitation. The Administrator shall have the authority under this section to gather any necessary information, including requiring the source to conduct modeling, if necessary.

(f) Nitrogen Oxide Control Requirements—

(1) Any modification, as defined in section 169(2)(C), at an existing electric utility steam generating unit subject to section 165 shall be deemed to satisfy the technology requirements of section 165(a)(4) for nitrogen oxides if it meets the following:

(A) For a unit subject to a requirement promulgated pursuant to section 407, immediately following the modification, the unit shall be required to meet the nitrogen oxide emission limitation specified for that boiler type pursuant to section 407. In the event that the modification precedes the establishment of nitrogen oxides emissions limitations for that boiler type pursuant to section 407, the unit shall be required to meet the applicable emission limitation upon the date required by the regulation.

(B) For an existing electric utility steam generation unit not subject to section 407, immediately following the modification, the unit shall be required to meet the nitrogen oxide limit equivalent to the limit achievable using "low-NO_x burners."

(2) Any State or local permitting authority shall retain the right to impose more stringent limitations for control of nitrogen oxides.

(g) Definitions.—For purposes of this section,

(1) "Pollution Control Project" means any physical change, or change in the method of operation, at an existing electric utility steam generating unit for purposes of reducing emissions from such unit in order to comply with Title V. Such changes are limited to:

(A) Installation of conventional or innovative pollution control technology, including but not limited to conventional and advanced flue gas desulfurization, sorbent injection for SO₂ and NO_x controls and electrostatic precipitators; and

(B) Physical changes, or changes in the method of operation, to accommodate switching to fuel which is lower in sulfur content than the fuel used prior to the change, including natural gas or coal re-burning, co-firing of natural gas and other fuels for the purpose of controlling SO_2 or NO_x emissions; and

(C) Clean coal technology demonstration projects conducted under Title II, section 101(d) of the Further Continuing Appropriations Act of 1985 (section 5903(d) of title 42 of the United States Code), or subsequent appropriations, up to a total amount of \$2,750,000,000 for commercial demonstration of clean coal technology, or similar projects funded through appropriations for the Environmental Protection Agency.

(2) "Representative Actual Annual Emissions" means:

(A) for the period prior to a physical change or change in the method of operation of a unit, the average rate, in tons per year, at which the unit actually emitted the pollutant during the two-year period which precedes the change, provided that the Administrator shall allow use of a different consecutive two-year period within the 5 years before the change, where the Administrator determines that such a period is more representative of normal source operations; and

(B) for the two-year period after a physical change or change in the method of operation of a unit, (or different consecutive two-year period within 10 years after that change, where the Administrator determines that such period is more representative of normal source operations), the projected average rate in tons per year at which the source is projected to emit a pollutant, and considering the effect any physical or operational changes have on increasing or decreasing the hourly emissions rate and on projected capacity utilization. In projecting future capacity utilization, the Administrator (i) may consider all relevant information, including but not limited to, historical operational data, the company's own representations, filings with State or Federal regulatory authorities, and compliance plans under the Title V of this Act, and (ii) shall exclude that portion of the increased rate of utilization, if any, due to factors unrelated to the physical or operational change, including an increase in projected capacity utilization equal to the rate of electricity demand growth for the utility system as a whole.

(h) EPA Guidance.—Within 24 months of enactment of this section, the Administrator shall, after notice and the opportunity for public comment, issue guidance for use by permitting authorities in determining criteria under which various refurbishment projects would be considered routine or nonroutine.

NOTE: References to "section 407" refer to S. 1630. Other section numbers refer to the current Clean Air Act.

COUNCIL OF ECONOMIC ADVISERS,
EXECUTIVE OFFICE OF THE PRESIDENT,
Washington, DC, September 11, 1990.

HON. WENDELL H. FORD,

Chairman, Subcommittee on Energy Research and Development, Committee on Energy and Natural Resources, U.S. Senate, Washington DC.

DEAR CHAIRMAN FORD: This is in response to your letter of May 18, 1990 regarding the WEPCO issue and my testimony of May 8, 1990. Answers to the specific queries posed in the attachment to your letter are enclosed. These answers are most usefully considered in the context of the legislative language developed in close collaboration with EPA and DOE and forwarded to you under separate cover on July 23.

One point of clarification is in order to avoid any chance of misunderstanding. Although technically the addition of a new unit to an existing source is considered a modification under Prevention of Significant Deterioration provisions of the Clean Air Act, the changes to the modification provision proposed in our July 23 language are not intended to apply to such projects. Such projects should still be subject to full new source review.

I apologize for the delay in replying to your questions. Please do not hesitate to call on me if I can be of further assistance regarding any aspect of this issue.

Sincerely,

RICHARD SCHMALENSSEE,
Member of the Council.

[Enclosure.]

RESPONSES FROM RICHARD SCHMALENSEE (CEA) TO SENATOR FORD'S QUESTIONS ON
ADMINISTRATION TESTIMONY REGARDING S. 1848

Question 1.a. While ICF's "high impact case" estimate of the additional cost of compliance under acid rain legislation due to WEPCO seems very unrealistic, would you agree that ICF's "low impact case" cost estimate of \$1 billion in additional costs is reasonable? Please explain your answer.

Answer. To date, WEPCO is one of the few utility plants to trigger the modification provisions at existing units. However, given the forecasted reliance on refurbishment in the electric utility sector clearly more WEPCOs are in store. To be sure, given the case-by-case application of the PSD program, its precise future impact is difficult to estimate. The UARG study is based on explicit out-of-model assumptions about how broadly the modification rule would apply to utility boilers. The Administration believes that the low impact case assumptions concerning the types of plants that might be subject to the modification rule are plausible. This case assumes that roughly 15 gigawatts of existing coal-fired utility capacity would be subject to new source review regulations. However, while the assumptions regarding the incidence of the modification rule are plausible, the cost and emission reduction estimates in the UARG low impact case may be both too high for several reasons.

The UARG low impact scenario assumed that only those coal-fired power plants with historically poor performance and availability would trigger the modification provisions of PSD. The low impact scenario also assumed that all oil-capable units which were predicted to switch to natural gas in EPA's base case forecast, would be affected—meaning, potentially subject to PSD as a modification.

Several factors suggest that the cost estimates in the UARG study may be high. First, the UARG study assumes that all capacity that would be affected by the PSD provisions is required to meet the NSPS provisions, that is, to achieve the same emissions rates that would be required of an entirely new unit. This clearly is not the case. Apparently, the basis of this assumption was the WEPCO case in which three of the five units were subject to NSPS as well as to the PSD provisions. Some refurbishment projects may in fact lead to an increase in maximum hourly emissions, and thus an NSPS determination. Of course, the extent to which projects fall into this category would depend on the procedure for determining baseline maximum hourly emissions, an issue addressed in our legislative proposal, and the nature of a particular project involved. However, those projects that did not increase maximum hourly emissions would be subject only to the PSD provisions.

Second, the UARG study assumed that the only technology available to meet the NSPS would be wet limestone scrubbing—the most expensive of the retrofit SO₂ removal technologies available. In reality, it is likely that less expensive removal technologies might be used to "net out" of NSPS, e.g., dry scrubbing and sorbent injection. Moreover, if a plant were to install wet scrubbing to maximize SO₂ reduction in order to create allowances for use in the acid rain trading program, those incremental costs should not be attributed to the NSPS or PSD compliance requirements.

Third, since both the Senate and House bills repeal the percent deduction requirement in the NSPS provisions, no technology at all may be needed to net out of any potential increases in hourly SO₂ emissions. Units potentially subject to NSPS as modifications would be free to switch to lower sulfur coal, oil, or gas to keep hourly emissions from increasing, although not without cost.

It also appears that the UARG estimates of costs and emission reductions for NO_x controls at coal-fired plants under the modification rules are somewhat high, although the situation here is less clear than for SO₂. For NSPS purposes, the installation of low-NO_x burners, which both the Senate and House bills require at all wall-fired boilers and tangentially fired boilers, could be used to avoid an increase in hourly emissions. For cyclone and wet bottom boilers, however, it is not clear what options are available to keep hourly NO_x rates from increasing. For PSD purposes, where the relevant tests involve annual emissions, it is not clear what measures could be applied to reduce NO_x emissions at a unit where low NO_x burners are already in place and further investment in a pollution control project that would lead to greater use of the facility under an environmentally sound dispatch plan is contemplated. However, only the costs associated with netting out emissions are appropriate to a cost analysis of the modification rule.

The UARG low-impact assumption for oil-capable boilers seems to be reasonable—that is, oil-fired boilers adding the capability to burn natural gas were assumed to

net out of PSD by reducing emissions at the plant to offset any potential increases in emissions.

Taking a broader perspective on your question, we can look at the situation from two perspectives. First, how does the planned acid rain program affect PSD/NSPS compliance costs and emission reductions? Inversely, how does the existing PSD/NSPS program affect the costs/operation of the planned acid rain program?

The impact of the acid rain program on new source review compliance costs reflects two conflicting forces. On the one hand, compliance actions taken to meet the requirements of the acid rain program would be likely to increase the number of existing facilities facing new source review as compared to a "business as usual" scenario. However, the salability of sulfur dioxide emissions allowances, freed up by NSR-mandated reductions in sulfur dioxide emissions, and the fact that some investments can satisfy both NSR and acid rain program requirements tend to work in the opposite direction.

Despite the problems noted above, the UARG study provides an illustration of how the presence or absence of an acid rain program might affect PSD program costs. UARG believes that the incremental cost of the PSD program without an acid rain program ranges from \$1.1 billion to \$9.5 billion in 2010. With an acid rain program, PSD costs range from \$1.0 billion to \$7.2 billion. However, the incremental NO_x and SO₂ emission reductions from the PSD program are significantly lower with the acid rain program in place than without it. For NO_x, emission reductions with PSD alone range from 0.2 to 1.3 million tons from the baseline. With an acid rain program in place, the incremental reductions from PSD are 0.1 to 0.4 million tons. Furthermore, with an acid rain program in place, PSD has no impact on aggregate SO₂ emissions.

Taking the inverse perspective, the additional costs and uncertainty imposed pursuant to any triggering of the modification provisions of the Act, as presently implemented, could easily dissuade utilities from engaging in some sound projects that otherwise would have been undertaken as part of the low-cost acid rain compliance strategy. Attempts by utilities to work around the present modification rule process would thus tend to raise the actual cost of acid rain compliance. Administration analyses of acid rain compliance costs do not account for these impacts, because they are highly dependent on case-by-case conditions.

The strong interaction between the new source review and acid rain programs suggests the advisability of revising the former, along the lines suggested in the Administration's WEPCO proposal, while enacting the latter.

Question 1.b. The ICF study indicates that enforcement of the WEPCO policy would result in no additional sulfur dioxide (SO₂) emissions reductions over and above those that would occur under acid rain legislation and a slight reduction of 100,000 tons of nitrogen oxide (NO_x) emissions attributable to enforcement of the WEPCO policy. Do you agree with ICF's assessment?

Answer. No incremental sulfur dioxide reduction beyond the large reductions mandated under the acid rain program was forecast under the UARG study because source-specific reductions associated with triggering the modification provisions will translate into higher emissions levels at other plants, due to the operation of the national sulfur dioxide emissions trading program. The application of the modification rule can change the allocation of SO₂ emissions across plants, but not their overall quantity, which is determined by the national cap on total emissions. However, the PSD program, and the Administration's proposal regarding its application will continue to protect local air quality values in all areas.

Given that most wall-fired and tangentially fired boilers are required to install low-NO_x burners under the acid rain program, we would be suspect of large NO_x control costs or emission reductions associated with the application of the modification rule on top of that program. The UARG estimate of incremental NO_x reduction estimates apparently reflects the high degree of control required under the acid rain program, which leaves few situations where further control would be necessary or possible under new source review. Indeed, the UARG study assumes more stringent and costly additional NO_x controls than would likely be installed in most cases.

The comments presented above apply specifically to the "low impact" case. A higher level of NSR incidence would, of course, tend to offset the influences tending to reduce total cost cited above.

Question 1.c. Assuming ICF's assessment of additional NO_x emissions reductions attributable to EPA's enforcement of the WEPCO policy to be true and also assuming ICF's "low impact case" cost estimate to be true, would the additional NO_x emissions reductions be cost effective under the criteria that the President has stated for his approval of clean air legislation that might be passed by the Congress?

Answer. The UARG low-impact cost estimate is \$800 million (year 2000) to \$1 billion (year 2010) above the costs of the acid rain program. The incremental emissions reductions estimates for this case are 100,000 tons of NO_x. Overall SO₂ emissions would be unaffected by virtue of the acid rain program. However, as noted above, the UARG cost estimates may overstate actual costs—NSPS will not apply in all cases, lower cost technologies may become available, and the value of sulfur dioxide allowances may provide a significant cost offset. Moreover, facilities in some cases have the ability to avoid triggering the modification rule by implementing limited controls. Such behavior may lower costs and NO_x emissions reductions.

Estimated NO_x reduction costs for the Administration proposal and the House and Senate bills fall in the \$200 to \$400 per ton range.

Question 1.d. Should the NO_x emissions reduction program in Section 407 of S. 1630 become law, would compliance with Section 407 achieve the NO_x emissions reductions that might be achieved by enforcement of the WEPCO policy?

Answer. The acid rain title of the proposed Clean Air Act Amendments is projected to achieve a reduction in NO_x emissions from baseline levels of approximately 2.0 million tons by the year 2000 according to the latest ICF analysis of the Senate and House bills. (The House requirement for a 2.5 million ton reduction is met by substituting extra SO₂ reductions for 0.5 million tons of NO_x reductions under the SO₂ for NO_x trading provisions of the House bill.)

In the absence of the acid rain program, the UARG study estimates reductions in NO_x emissions from baseline levels of between 0.1 and 0.6 million tons by the year 2000 pursuant to the application of the current WEPCO policy. As noted above, there are several reasons why the UARG study probably overstates both the emissions reductions and costs of the modification rule.

The focus of the acid rain program is on aggregate emissions, while the PSD program is designed to protect local air quality objectives. Significantly, the Administration's proposal regarding the application of new source review to units subject to the acid rain program is designed to ensure that local air quality values are protected, while providing an appropriate degree of flexibility and predictability to utilities in planning their compliance with our ambitious program to achieve very large reductions in emissions that contribute to acid rain.

Question 1.e. Has the Council of Economic Advisers or any other office within the Administration performed its own analysis of: (a) the additional costs of compliance with acid rain legislation that might be attributable to EPA's enforcement of the WEPCO policy; and (b) additional emissions reductions over and above those that would occur under acid rain legislation that might be achieved as a consequence of the enforcement of the WEPCO policy? If the answer is yes, please provide copies of such analyses.

Answer. No government agency has performed an independent study of the type outlined in your question. As noted in our response to question 1.a., all Administration acid rain studies have assumed that compliance decisions are made without regard to the application of the modification rule. As our answer to question 1.b. indicates, we would not expect the application of the WEPCO policy, which focuses on emissions at the plant level, to reduce aggregate SO₂ emissions. Our answers to 1.a. and 1.b. explain why the incremental NO_x reduction identified by UARG (0.1 million tons in the low impact case) is probably an overestimate.

Question 1.f. Has the Council of Economic Advisers or any other office within the Administration analyzed the compliance cost and emissions reduction impacts of the principles for a legislative resolution of the WEPCO issue outlined in your testimony?

Answer. No.

Question 2. In your prepared written testimony at pages 7 and 8, you discuss the extent to which the Senate and House clean air bills address the WEPCO issue. In reference to Section 415(e)(3) of S. 1630, the Bumpers-Breaux-Bingaman Amendment, you state: "Some have suggested that this presumption [regarding capacity utilization] may be easily rebutted by either the utility's own announced plans for compliance with the acid rain program or by consideration of the likely impact of a project on utility dispatch plans." Do you view the presumption in Section 415(e)(3) as easily rebutted? Please explain.

Answer. For sources installing pollution control hardware, or switching from oil to natural gas as part of an SO₂ control program, we would expect the capacity utilization of the unit to increase after installation of the hardware, or after the conversion to gas. Our expectation is based on economics. It is reasonable to expect utilities to dispatch generating units based on lowest variable costs. With respect to scrubbers, they generally are less cost-effective at controlling SO₂ than fuel switching, but they are capable of achieving much greater SO₂ reductions at a given unit.

Moreover, their variable costs are a small fraction of their overall costs. For example, ICF's scrubber costs used in analyses for EPA include, for a 2.5 percent sulfur coal and in 1986 dollars, capital costs of \$192/kw, fixed O&M costs of 6.18 \$/kwyr, and variable O&M costs of 1.37 mills/kwhr. Assuming a 65 percent capacity factor, to enable comparison, the variable costs work out to about 23 percent of total scrubber costs. In this case, scrubber costs are about \$325/ton of SO₂ removed, but the variable scrubber costs are only \$75/ton of SO₂ removed. This variable cost is much less than the cost of low sulfur coal, which varies by region, but generally has a cost effectiveness ratio of \$200-\$300/ton of SO₂ avoided (almost all of which is a variable cost). As a result, all other factors being equal, a utility with a scrubber equipped unit and a unit burning low sulfur coal will generally prefer to run the scrubbed unit more, because its variable costs are less.

Similarly, for the oil-fired generator converting to natural gas, the conversion will likely be based on economics. In other words, it will be converted only if it is cheaper, considering both fuel prices and the cost of meeting SIP's and acid rain regulations, to operate on gas, rather than on oil with emission controls. Assuming there remain some oil-fired units in the utility system, the utility would generally prefer to utilize the converted unit more, and other oil-fired units less.

The utility's dispatching intentions must be made clear to the permitting authority because of provisions in §§ 408(c) and (d) of S. 1630. These provisions require owners and operators of units subject to Phase I or Phase II limitations to submit permit applications and proposed compliance plans for review and approval by the permitting authority. Because compliance is based on annual emissions of SO₂, not hourly rates of emission, it will be essential for the utility to explain not only the hourly emission rate of a unit, but also the level of expected capacity utilization of the unit. Given that historical levels of capacity utilization are a matter of public record, any change in utilization rates before and after pollution controls are installed will be self-evident. This is the basis for the statement in my testimony suggesting that utilities will themselves rebut the constant capacity factor presumption.

Question 3. In your prepared written testimony at page 9, you state that "the administration supports a broad, generic legislative resolution [of the WEPCO issue] that has seven basic elements."

A. Why is this a legislative proposal? Why could you not accomplish the same result by administrative action under current law?

Answer. As stated in my testimony, much of what the Administration seeks to accomplish through this legislative proposal could be accomplished by administrative action under current law. However, a clear statement in law will provide a firmer foundation for utilities to plan and implement cost-effective long-run strategies to achieve the very large required reductions in emissions that contribute to acid rain while continuing to maintain capacity and reliability in the electric supply system. Relying solely on administrative action will increase the uncertainty faced by the utilities that already have to implement a number of technically complex and costly revisions in their operating procedures to comply with the new Clean Air Act.

Other adjustments needed to take account of the interaction between the application of the existing modification rule and the acid rain program can only be addressed through legislation. The Senate and House share this concern, as reflected in the provisions of Sections 415 and 512 of their respective bills. The Administration seeks to provide an appropriate degree of flexibility and predictability to utilities subject to the acid rain program. It recognizes that the acid rain program—with its unique emissions cap and tradable allowances provisions—creates a special set of conditions that necessitate changes in the application of the modification rule.

With reference to the proposed legislative language submitted on July 23, let me highlight the provisions that could be undertaken administratively under current law and those that would require a legislative change:

a. *NSPS Emission Increase Calculations.*—EPA's current regulations provide for a comparison of the hourly emission rate, just prior to a physical or operational change, with the hourly emissions following the change to determine whether or not emissions will increase as a result of the change. The proposed legislation would use as a baseline the highest hourly emissions level achievable any time during the 5 years prior to the change. The EPA could accomplish the same result through rule-making.

b. *Pollution Control Projects.*—EPA could through administrative action exclude certain pollution control projects from NSPS and PSD review. Under current law, however, it would be difficult to consider for PSD purposes the change only with respect to that pollutant for which there is an increase in potential emissions. No

basis for such a distinction exists in the current statutory provisions relating to PSD review. Further, EPA could through rulemaking make certain changes to the method of calculating emissions increases under PSD. Changing to a maximum hourly emissions test as set forth in our legislative proposal, or to the potential emissions test in the House bill, however, would be difficult under current law.

c. Safe Harbor Provision.—Current EPA regulations exempt routine projects from new source review. EPA can issue guidance or regulations clarifying what types of projects would be considered routine and thus not subject to new source review. The safe harbor provision, however, would broadly expand administrative exemptions to the statutory requirements in order to exclude nonroutine physical renovations that were complementary to and contemporaneous with a pollution control project, so long as their cost did not exceed 20 percent of the cost of the total project. It provides a mechanism through which utilities can themselves determine the applicability of new source review to a set of physical or operational changes intended to control pollution plus other complementary, contemporaneous renovations that would be needed to take full advantage of this pollution control investment to comply with the acid rain program. Sources wishing to use the safe harbor must also implement NO_x controls under Section 407 on an accelerated basis. Despite the importance of the safe harbor in promoting a smooth implementation of emission reduction mandates under the acid rain program, a reviewing court likely would find it to be inconsistent with the present statute if implemented through rulemaking. See *WEPCO v. Reilly*, 893 F.2d 901, 909 (7th Cir. 1990).

d. Systemwide Netting.—The proposal to allow, but not require, the relevant permitting authority to use systemwide netting among various utility sources to calculate whether an emissions increase will occur for new source review purposes could not be accomplished under current law. The definition of "source" under current law cannot be construed so broadly as to encompass facilities that are not within a single plant.

e. Modeling.—The modeling provision could be adopted through administrative action.

f. Generic NO_x BACT Determinations.—Under current law, a BAT determination must reflect the maximum reduction in emissions achievable on a case-by-case basis, taking into account individual characteristics of the particular source and can be no less stringent than the NSPS. See CAA § 169(3). Therefore, a finding that a particular NO_x control technology or emission limit constitutes BACT for an entire source category could not be made through administrative means.

g. Nonpollution Control Projects.—The Administration proposal would adopt an "actual-to-actual" methodology for calculating emissions increase for purposes of new source review under Parts C and D of Title I. It would also exclude emission increases due to demand growth and other factors unrelated to the modification, since such emissions increases would occur even if no modification were undertaken. These changes could be implemented through rulemaking.

Question B. Should S. 1630 as written become law, could the Administration's proposal for resolution of the WEPCO issue be implemented by administrative action? If not, do the WEPCO provisions in S. 1630 preclude administrative implementation of the Administration's proposal?

Answer. The Administration's legislative proposal differs from the Senate bill in three key respects. The Senate bill would subject a substantial group of pollution control projects to PSD and NSPS review, since it incorporates an emissions increase test in which the projected increased utilization of plants with new pollution controls to meet acid rain objectives would trigger new source review. The Administration proposal would exempt pollution control projects from NSPS and Part C requirements, provided that maximum hourly emissions do not increase, and would not apply new source review requirements for those pollutants for which maximum hourly emissions decrease or remain constant. This maximum hourly increase test will provide for smoother compliance with the emission reduction mandates of the acid rain program.

Also, there is nothing comparable to the Administration's "safe harbor" provision in the Senate bill. This provision ensures that whatever latitude is afforded to pollution control projects in all of the bills could not be offset due to the triggering of NSR by other complementary, contemporaneous renovations valued at up to 20 percent of the total project needed to take full advantage of a pollution control project that does not increase maximum hourly emissions. Such a provision is necessary to avoid discouraging compliance strategies designed to use clean plants with pollution control projects more intensively and dirty plants less intensively.

A third difference is that the Senate bill exempts repowering projects from NSPS-reconstruction provisions. The Administration's proposal would generally subject

these projects to NSPS. Other differences also exist, such as the provision for systemwide netting of emissions in the new source review process to allow the regulatory authority, at its option, to take into account the reduction in emissions at other facilities which will occur as utilities reallocate their generation load to make greater use of units equipped with pollution control projects.

The answer to Question 3.a. already identifies the components of the Administration proposal which could be undertaken administratively under current law. The WEPCO provisions of S. 1630 would, to the extent that they provide statutory guidance, preclude some actions that are administratively feasible under current law. For example, it may not be possible to exclude demand growth from the rebuttable presumption test under Section 415(e)(3). Overall, the WEPCO provisions of S. 1630 do not provide nearly as many guaranteed options for utilities to implement environmentally sound compliance and system planning options at the lowest possible cost.

Question C. Should H.R. 3030 as reported by the Committee on Energy and Commerce become law, could the Administration's proposal for resolution of the WEPCO issue be implemented by administrative action? If not, do the WEPCO provisions in H.R. 3030 preclude the Administration's WEPCO proposal?

Answer. [Because the House passed its version of the Clean Air Act subsequent to the issuance of these questions, we have responded to this question based on the House Bill as passed.]

Section 512(b) of the House bill provides that no physical or operational change in a unit for purposes of reducing emissions in order to comply with the acid rain title shall be treated as a modification for purposes of Section 111 (NSPS) or Part C of Title I (PSD) provided potential emissions do not increase. The Administration's proposal for pollution control projects (other than CT projects) is similar to the language contained in Section 512(b). However, because there is no safe harbor provision in the House bill, the extent of usable relief to pollution control projects may be limited.

Section 515 directs the Administrator to issue regulations to facilitate temporary and permanent CCT projects. In determining whether or not an emissions increase would occur for permanent CT projects, Section 515(c) directs the Administrator to compare pre-project actual emissions with projected future emissions projecting a future 70 percent capacity utilization factor. Under Section 515 of the House Bill, fewer CT projects would likely be exempt from NSPS and PSD review because the emissions increase calculation is actual-to-projected actual, assuming 70 percent capacity, while the Administration's proposal uses a maximum hourly test for CT projects.

Repowered sources are also afforded certain relief under Section 508(c) of the House Bill. These sources are exempt from any NSPS. They are also exempt from the new source requirements of Part C or D if projected emissions do not increase over past actual emissions. As with CT projects, future emissions are to be projected using a 70 percent capacity factor. (Repowering is defined in Section 502(c)(14).) In some cases, repowered projects would qualify as pollution control projects under the Administration's proposal. The Administration's proposal would not, however, exclude these projects from NSPS reconstruction rules. In other cases, they may be treated as nonpollution control projects.

These are the only House provisions that relate directly to the Administration's proposal. Since both the House and Administration proposals operate via exclusion, all or parts of these proposals could coexist if both were legislatively authorized. With respect to administrative steps, other actions identified in response to question 3.a. could be undertaken to the same extent as identified in the response to that question, provided that they were not precluded by new statutory language.

*Question 3.** [Note that this is the second question labeled as "3" from the questions submitted].

In your prepared written testimony at page 11, you state: "However, units seeking to take advantage of this provision would be required to meet the NO_x reduction limits required by the applicable final rule, if any, issued under Section 407(b) as a part of the total project."

A. What if a powerplant undertakes nonroutine physical or operational changes prior to the issuance of an applicable final rule under Section 407(b)?

Answer. If a powerplant undertakes a nonroutine physical or operational change under the "safe harbor provision" prior to the issuance of an applicable final rule under Section 407(b), the unit would be required to meet the applicable emission limit upon the date required by the rule that is ultimately issued. Until that time, the unit must meet an emission limit equivalent to that achievable using low-NO_x

burners on that type of unit. This is reflected in Section (b)(2)(B) of the proposed legislative language submitted to you on July 23.

Question B. Under Section 407 (a), an affected unit for purposes of SO₂ reduction requirements shall be an affected unit for purposes of the NO_x limitations set forth in Section 407. Does this mean that the net effect of the above-quoted sentence is to accelerate the applicability of NO_x reduction requirements for "utility pollution control projects?"

Answer. Under the legislative proposal, any unit installing a pollution control project and undergoing contemporaneous non-routine physical or operational changes costing up to 20 percent of the total cost of project would be subject to the NO_x requirements as applicable to it at the time of the project. In some instances, this may accelerate the time for compliance with the NO_x requirements. However, the schedule for compliance with Section 407 requirements would not be affected for projects that do not take advantage of the "safe harbor" provision.

Question C. What do you intend by the term "this provision" in the above-quoted sentence? Do you intend to refer only to the provision governing units that make [modifications] which are not entirely "utility pollution control projects" (i.e., the units discussed in the paragraph in which the above-quoted sentence appears)? In the alternative, do you intend to refer to the provision governing all "utility pollution control projects" including projects in which all changes are made entirely for purposes of reducing emissions in order to comply with the acid rain title of clean air legislation?

Answer. The phrase "this provision" at page 11 at my testimony refers to the "safe harbor" provision. The "safe harbor" provision (as outlined in Section (b)(2) of the legislative language) applies to projects that are pollution control projects and also include some other contemporaneous change. The cost of these other changes may not exceed 20 percent of the total cost of the project. "Pollution control projects" which incorporate no other changes, and do not need the "safe harbor" must, as in the House bill, satisfy only the emissions increase test, i.e., that maximum hourly emissions do not increase.

Question 4. Physical or operational changes which improve power plant efficiency reduce fuel consumption per unit of energy output and correspondingly reduce emissions per unit of energy output. In view of this, would the term "utility pollution control project" include nonroutine physical or operational changes intended to improve powerplant efficiency if such changes were undertaken as part of a utility's strategy for compliance with the acid rain title of legislation to amend the Clean Air Act?

Answer. Our proposal contemplates that a "Pollution Control Project" would consist of those physical and operational changes outlined in Section (g)(1). There is no specific provision for investments in powerplant efficiency as such. Of course, under the safe harbor provision, a limited value of complementary, non-routine physical or operational changes can be treated as part of a pollution control project.

Question 5. From your testimony at page 11, it would appear that whether a power plant modification qualified as a "utility pollution control project" would depend on the intent of the powerplant operator.

A. How would this standard apply to powerplant modifications that reduce emissions subject to the acid rain title of clean air legislation, but which are undertaken prior to the date that emission reduction deadlines take effect? What about projects undertaken pursuant to [to] emissions reduction requirements under State law?

Answer. Power plant modifications that reduce emissions subject to the acid rain title of the clean air legislation would qualify as "utility pollution control projects" and be treated as such once the legislation becomes law. This would apply to any qualifying project, as of the date the legislation becomes law, regardless of when the emission reduction is undertaken. The legislation considers a "utility pollution control project" to be those changes implemented for the purpose of complying with the acid rain title. It does not cover changes made pursuant to State law.

Question B. If such modifications did not qualify as "utility pollution control projects," this would constitute a penalty against early emissions reductions. Would there be any legal or public policy justifications for such a result?

Answer. There is no public policy rationale for excluding projects undertaken prior to the date that emission reduction deadlines take effect from the category of "utility pollution control projects." Indeed, any such exclusion would appear to contemplate significant assistance from supernatural forces in executing pollution control projects at the instant they must be in place to meet statutory requirements.

Question 6. In your prepared written testimony at page 10, you state that "a project that did not increase annual emissions of a source above the levels used in establishing the baseline or in determining increment consumption would be consid-

ered to meet annual PSD requirements for that source without any further showing."

A. Is this a restatement of existing policy under the PSD program or is it intended to be a new formulation of policy under the PSD program?

Answer. This is a statement of policy to accommodate the proposed change in the method of calculating emissions for pollution control projects. The legislative language of the Administration proposal provides that if the source will not increase its actual emissions over the level of emissions that was used in the most recent air quality impact analysis, the source's contribution to the consumption of PSD increment is unchanged, and no further modeling is needed, unless the Administrator determined that the earlier modeling was unreliable or otherwise concludes that an additional showing is needed to protect air quality values.

Question B. Under this formulation, how would an "increase in annual emissions of a source" be measured?

Answer. An increase in representative actual annual emissions would be based on a comparison of (1) the average rate in tons per year at which the source actually emitted during the two years preceding the proposed change (or some other representative 2-year time period within the previous 5 years), and (2) the projected average rate in tons per year at which the source will emit a pollutant, based on projected future capacity utilization for the 2 year period following the change (or some other 2-year period within 10 years after the change), but excluding increases in the rate of utilization due to systemwide demand growth and other factors unrelated to the physical or operational change.

Question 7. In your prepared written testimony at page 10, you state that "part D review and permitting requirements would also be triggered by any nonroutine physical change, including pollution control projects, that resulted in a net increase of pollutants in a nonattainment area that would exacerbate exceedence of air quality standards. The net increase determination would be based on a comparison of before and after emissions across representative periods."

A. What would constitute a "net increase of pollutants . . . that would exacerbate the exceedence of air quality standards"? For example, would an increase in NO_x emissions "exacerbate the exceedence of air quality standards" in an ozone nonattainment area?

Answer. The existing new source review regulations for new and modified major sources specify certain significance levels for each of the various criteria pollutants. In a nonattainment area, an existing major source of a nonattainment pollutant proposing a nonroutine physical or operational change would exacerbate the existing violation when, as a result of the change, the net increase of that nonattainment pollutant is significant. Accordingly, in an ozone nonattainment area, a proposed project with a significant net increase of volatile organic compound emissions (i.e., 40 tons per year increase in emissions) would exacerbate the violation of the ozone air quality standard. Likewise, a significant net increase in NO_x emissions in a SO₂ nonattainment area would exacerbate the existing SO₂ violation.

The relationship between NO_x emissions and ozone formation in the individual ozone nonattainment area would be considered in determining whether or not a significant increase in NO_x emissions would exacerbate an ozone nonattainment problem. The same concern is reflected in the attainment title of the House bill, which recognizes that there should be substitutability between NO_x reductions and HC reductions in meeting progress requirements in some areas, but not in others. Where EPA determines that ozone is not sensitive to NO_x, it would not presume that NO_x emissions exacerbate an ozone nonattainment problem.

Question B. How would a "net increase" in emissions be measured? Would it be on the basis of a comparison of the power plant's pre-modification and post-modification potential to emit? Would it be on the basis of a comparison of the power plant's pre-modification and post-modification actual emissions?

Answer. The basis for comparison would be essentially a comparison of the power plant's pre-modification and post-modification actual emissions, with a "net increase" in emissions measured in terms of changes in a power plant's "representative actual annual emissions." For the pre-modification period this means the average rate, in tons per year, at which the power plant actually emitted the pollutant during the 2-year period which precedes the change or any 2-year period within the 5 years prior to the change which is more representative of normal plant operation. Post-modification emissions means the projected average rate, in tons per year, at which the power plant is projected to emit a pollutant during the 2-year period following the change (or any 2-year period up to 10 years after the change) excluding increases due to factors unrelated to the physical or operational change, such as systemwide demand growth.

Question C. How do you intend to define the term "representative periods?" For example, what would be the representative period for a powerplant that was shut down during the period immediately prior to its modification or a power plant whose capacity was substantially underutilized during that period due to broken or worn equipment?

Answer. The representative period is initially considered to be the 2 years prior to the change. However, the use of a different consecutive 2-year period within the 5 years before the change would be used where the Administrator determines that such a period is more representative of normal source operations. For a power plant that was shut down during the period immediately prior to its modification or a powerplant whose capacity was substantially under utilized during that period due to broken or worn parts, the most recent 2 years most likely will not be representative of normal operation. Therefore, the use of the most recent 2-year period would not apply and a different 2-year period within the last 5 years would be used to establish pre-modification emissions.

Question 8. In your prepared written testimony at page 11, you state that "[n]onroutine physical or operational changes at existing steam electric generating units other than utility pollution control projects should not be deemed major modifications subject to the review and permitting requirements of part C and D of Title I unless they result in a net increase in annual emissions."

A. You appear to imply the necessity of a causal relationship between increases in annual emissions and the change made at the power plant. Is this what you intended?

Answer. Yes. The intent of the Administration's proposal is that increases in emissions which are due to growth and which are not directly related to the change being made at the power plant should not be considered in the calculation of an increase in actual annual emissions.

Question B. How would you treat a situation where an increase in emissions was not directly causally related to the power plant modification? For example, how would you treat a case where capacity utilization increased due to economic growth in a utility's service area? What about a situation where a utility's economic dispatch of the modified powerplant was altered due to a change in operating costs such as a new fuel contract?

Answer. If demand growth causes an increase in utilization of a unit which has undergone a physical change, or change in the method of operation, then the portion of the increase in demand which is unrelated to the change would not be considered in calculation of the increase in representative actual annual emissions. On the other hand, if the change results in: (a) removing bottlenecks, an outright increase in capacity or reliability, or (b) less expensive power production, which leads to greater dispatching, then the portion of capacity utilization attributable to these results from the change would be included in calculation of emissions increases. The provision for systemwide netting at the option of the regulatory authority would be relevant to the latter circumstance.

Question 9. In your prepared written testimony at page 10, you state that "[a]s in the Senate and House Committee bills, temporary CT projects should be exempt from NSPS, PSD, and NA review provisions."

A. Would the change in emissions as a consequence of the removal of a "utility pollution control project" be treated the same as the change in emissions that resulted from the removal of a temporary CT project?

Answer. Our proposal does not contemplate the removal of a "utility pollution control project." An issue may arise with respect to "reverse" fuel switching that may occur as a utility adjusts its compliance strategy by increasing emissions at some plants following a decrease at others. However, switching among fuels at a facility that is capable of burning multiple grades or types of fuel without undergoing a nonroutine physical change is, in our view, a routine change that does not trigger the modification rule.

Question B. If not, how would such a change in emissions be treated? For example, what if the pollution control technology did not perform up to expectations? What if the "utility control project" was installed in order to comply with phase I emissions reduction requirements and removed when the utility chose to control another power plant as part of its phase II compliance strategy?

Answer. Temporary emission control projects, even those that don't work as expected, are not subject to NSPS or NSR, as long as hourly emissions after the demonstration do not increase above pre-demonstration levels. As for removing a Phase I control as part of a utility's Phase II plan, the likelihood of this appears to be remote. Logically, a utility would be unlikely to invest substantial financial capital in a permanent Phase I control system and then remove the system only a few

years later under Phase II. If the phase I controls were part of an unsuccessful temporary demonstration, then NSR and NSPS would not apply and only the system-wide Phase II requirements would be applicable.

Question 10. In your prepared written testimony at page 11, you state that "[a]ny nonroutine physical change in, or change in the method of operation of, an existing steam electric generating unit for the purposes of reducing emissions at that unit in order to comply with the acid rain title of the Clean Air Act should constitute, for present purposes, a 'utility pollution control project.'"

A. Would the term "utility pollution control project" apply to powerplant modifications made for the purposes of compliance with other provisions of amendments to the Clean Air Act? If not, please explain why.

Answer. Only modifications made to comply with acid rain provisions of the Clean Air Act Amendments would be considered a "utility pollution control project" under our legislative proposal for Title IV. Where differentiated treatment for the electric utility industry is warranted for other provisions of the bill, such as the air toxics title, appropriate provisions should be included within that title.

The acid rain program is unique in several respects. Unlike other titles affecting stationary pollution sources, it is focused on one economic sector. In contrast to other programs, where shifts in operations among plants are largely a matter of secondary interest, the emissions trading system of the acid rain program encourages utilities to adjust their dispatch to meet their obligations in a cost-effective manner. For the trading system to operate effectively, maximum flexibility and predictability must be provided to utilities, while ensuring that local air quality values are protected as the Administration's WEPCO proposal. The acid rain program is also unique in its absolute ceiling on sulfur dioxide emissions and its comprehensive retrofit requirements for NO_x. As both the House and Senate bills recognize, these distinct features necessitate legislative changes governing the application of the modification rule to pollution control projects under this title. This does not necessarily hold true for projects undertaken pursuant to other titles of the bill in a wide variety of sectors under a variety of conditions.

Question B. By the term "steam electric generating unit" did you intend to exclude from the definition of "utility pollution control project" changes to combustion turbines intended to reduce emissions? Note that Title IV of S. 1630 no longer uses the term "steam electric generating unit" and that the term "unit" is defined simply as "a fossil fuel-fired combustion device."

Answer. The acid rain program under Title IV does not apply to existing simple combustion turbines and thus, our proposed changes in the application of the modifications provisions of Title I should not apply to them either.

Question C. Would a modification of a non-utility unit made for purposes of reducing emissions of pollutants regulated under the acid rain title of amendments to the Clean Air Act be eligible for treatment as a "utility pollution control project?" Note that under Section 410 of S. 1630 a non-utility unit may reduce emissions and opt in to the emissions allowance system under Title IV.

Answer. A non-utility unit that "elects in" under Section 410 would not be eligible for the definition of a "utility pollution control project". It would be inappropriate to extend the proposal to other industries, which are not targeted by the acid rain program or subject to its sulfur dioxide emissions cap or low-NO_x technology requirements. Unlike electric utilities, other industries are not being forced to make significant physical and operational changes.

Question 11. In your prepared written testimony at page 11, you state that "[u]tility pollution control projects would be evaluated in terms of their impacts on maximum hourly emission rates, following current policy toward NSPS reviews. Thus, a utility pollution control project that does not increase maximum hourly emissions of any criteria pollutant compared to a representative period prior to the project should not be deemed to be a major modification subject to the review and permitting requirements of Part C of Title I."

A. What is "current policy toward NSPS reviews?" Does the above-quoted excerpt from your prepared testimony reflect such "current policy"? In *WEPCO v. Reilly*, the U.S. Court of Appeals for the 7th Circuit deferred to EPA's interpretation that use of a "representative" period was not required for determining baseline emissions rates under the agency's NSPS regulations. On the other hand, in its January 30, 1990, letter to the Indiana Department of Environmental Management, EPA appears to suggest that in its upcoming interpretative rule there would be some concept of a "representative" period for assessing the emissions consequences of the removal of a temporary CCT project.

Answer. The NSPS program is concerned with hourly emission rates from individual emissions units. Emission rates are calculated at maximum capacity before and

after the physical or operational change to determine if there is an increase. Current NSPS rules for calculations to determine whether an emissions increase has occurred contemplate that the calculations be done based on conditions just prior to and after the physical or operational change. However, the Administrator has discretion to determine the "before" emission rate based on past performance, where, for example, the unit on which a project is contemplated has suffered damage, a common occurrence in the electric utility sector. To provide maximum predictability in utility planning to comply with the acid rain program, we believe that it is important to provide a system under which utilities can easily evaluate their NSPS limits for each unit without seeking an EPA decision. Therefore, as reflected in the legislative language provided to you, we propose that utility sources should be able to use the highest hourly emissions rate achieved during the 5 years prior to the change in determining whether a change will increase hourly emission rates.

The EPA's January 30, 1990 and March 7, 1990 letters to the Indiana Department of Environmental Management include discussion of how actual emissions before a change are determined for a "representative period" of operation under existing PSD regulations, not NSPS. There is no explicit discussion of a representative period for "post demonstration emissions" for a temporary CCT project.

Question B. Is "current policy towards NSPS reviews" the same for pollution control projects as it is for other nonroutine changes?

Answer. If a project, whether pollution control or otherwise, does not increase maximum hourly emissions of an NSPS-regulated pollutant, then it is not subject to NSPS (unless reconstruction provisions are triggered, indicating a major construction of essentially new units). A pollution control project is subject to NSPS review if there is an increase in maximum capacity hourly emissions of any NSPS-regulated pollutant after the change. However, the EPA Administrator may determine, on a case-by-case basis, that the addition of a pollution control device to significantly reduce emissions of one pollutant may not be a modification even if there was a small increase in another NSR-regulated pollutant.

Question 12. In your prepared written testimony at page 11, you state that utility pollution control projects "would include, among other changes, gas co-firing."

A. Would other modifications to accommodate switching to a cleaner fuel also count as "utility pollution control projects?" For example, what about modifications to accommodate natural gas as fuel in a unit currently fired with oil? Or what about modifications to accommodate switching from high-sulfur coal to low-sulfur coal?

Answer. The Administration's proposed language explicitly cites, within the definition of "pollution control projects," "physical changes, or changes in the method of operation, to accommodate switching to fuel which is lower in sulfur content than the fuel used prior to the change. . . ." Such changes would include switching from oil to natural gas. However, the change must be "for purposes of reducing emissions from such unit in order to comply with Title V." Changes occurring after the enactment of the acid rain control program that met the definition established in Section (g) of the legislative proposal would generally be accepted as pollution control projects.

Question B. For purposes of NSPS review, would a powerplant that switched to a cleaner fuel receive credit for the reduction in its emissions rate attributable to the cleaner fuel? How does the court's holding in *WEPCO v. Reilly* bear on this answer?

Answer. No. Under the current NSPS for sulfur dioxide, which include a percentage reduction requirement, fuel switches are not credited when calculating emissions increases under NSPS. The method for determining emissions increases under the current NSPS directs that all operating parameters be held the same before and after the change. See 40 CFR 60.14(b)(2). Utilizing different fuels in making the determination of whether emissions would increase would be inconsistent with that directive. This issue was addressed in the *WEPCO v. Reilly* decision and the court deferred to EPA's discretionary authority. See 893 F.2d 901, 913-15 (7th Cir. 1990).

Question 13. What is your understanding of when EPA intends to release its interpretative ruling in response to the court's decision in *WEPCO v. Reilly*?

Answer. As noted in my May 8 testimony, EPA indicated in a letter to the Indiana Department of Environmental Management that an interpretative rule addressing *WEPCO* issues was under development. However, for reasons outlined in my testimony, and recognized in the Senate and House versions of Clean Air legislation, there are significant advantages to addressing these issues in a statutory setting. The focus of EPA and DOE effort has therefore shifted towards development of our legislative proposal and support of the legislative process.

Question 14. Please provide the Committee with legislative language incorporating the principles for a legislative resolution of the WEPO issue outlined in your prepared written testimony.

Answer. Legislative language was sent to the Committee under separate cover on July 23.

The CHAIRMAN. Thank you very much, Mr. Secretary.

Mr. Secretary, the American public is concerned about the price of gasoline. They are concerned about price gouging. And the way I figure it the price of crude oil since early June has gone up some 42 cents a gallon. Do you know what the price of gasoline has gone up to since early June?

Secretary WATKINS. Yes, sir, we do. We have a daily printout of that on both retail and wholesale. But maybe it would be good to just go through the process of monitoring what happens to gas prices—

The CHAIRMAN. First of all, can you tell me whether or not the price of gasoline reflects more or less than the 42-cents-a-gallon increase that the price of crude oil has gone up?

Secretary WATKINS. At the outset of the event, gasoline prices went up before the crude oil price ramp had really been felt. The gasoline price—and this is classic in the system of supply and demand in an open market system—at the tail end, right now for example, is lagging. That is, the price of gasoline is lagging the crude oil price equivalent by about 4 cents a gallon, whereas it exceeded 4 cents a gallon on the other side at the outset of this event. And that is rather typical of how the free market responds to this and averages this out, assuming you do not have local price gouging.

But a well-working free market, which I believe we have in this situation except for some local problems, is working very well and is rather typical of supply and demand situations. It averages out over time.

And obviously we watch for profiteering and other things. We have a very close relationship with the Justice Antitrust Division on this, along with the Department of Transportation.

The CHAIRMAN. Let me ask you this. The President and you and I and other members of this committee spoke out about price gouging right after this event occurred. And it appeared that there were price increases that did not reflect the cost of crude oil. Would that be fair?

Secretary WATKINS. Yes, sir, it is. And this is why I think it is very important that I give you the specifics of that so that it backs up what I just said. Because I think we have to understand how it is not unreasonable for this to happen as long as it does not stay up there and it comes down again when crude oil prices come down. And that we can take a look and see if excess profiteering was the case.

The CHAIRMAN. How long did that go on?

Secretary WATKINS. Not too long as a matter of fact. About a month. We are down to what I now consider to be a price of gasoline that is less than the crude oil price increase, if you know what I mean, and its equivalent.

The CHAIRMAN. In other words, the gasoline now is reflecting less price increase than the price increase for crude?

Secretary WATKINS. Yes, sir. And that was typical behavior after the Exxon Valdez spill. We saw the same kind of behavior in the marketplace and behavior of the oil industry in that regard.

The CHAIRMAN. There have been proposals or suggestions that we should have an anti-price-gouging piece of legislation, that we should adopt that on the Senate floor without going through committee. And so this may be your only chance to speak for it or against it.

I would ask you, is that a good idea to have that kind of legislation or not? And if so, why should we or why should we not?

Secretary WATKINS. I think the wording of the legislation would be very important. I think if we assume that everyone in America is a crook, that is the wrong signal to send. We have got a lot of good people out there.

We have had them in, we have had members of the oil industry, we have had consumers all together in a room talking seriously about this. They are as death on profiteering as we are, at least at the corporate level. I think they are serious about it. We are serious about it.

They know what we went through before with ERA in our own organization. I think that nobody wants to get back into that game again.

We are always going to have to watch carefully to make sure that we do not have violators of this. So, I just hope—it is the wording of the thing and it is the tone of it. Obviously we are all against profiteering. The President said so the other night—we are not going to tolerate profiteering. Whether you believe you need that law for the handful of violators, I think, is something that Congress needs to debate and see. I hope that it is—

The CHAIRMAN. Let me ask you this. Is it fair to say that such a law would require a system of price controls and a Federal bureaucracy at least as extensive as the past Oil Entitlements Program, which we had for some years and finally were able to get rid of?

Secretary WATKINS. Yes, sir, it would. We would have to prove that we are doing what the Congress has directed. And the degree of micromanagement of the words contained in the bill would determine how much of a bureaucracy we set up.

I would like to think that the request by the President, a sense from Congress on profiteering, it seems to me should be enough at this point in time. And, then, if early in the next year in the next Congress we feel that it has been woefully misunderstood out there and we have had some egregious violations of what we consider to be fair practices, I think obviously something should be done.

But I would like to try the first step first. It just seems to me that that is the right thing to do.

The CHAIRMAN. Mr. Secretary, on one of these charts, if someone would get that chart on the amount of shortfall, there is an indication that there is about 3 million barrels, if I recall correctly, a day shortfall this month. In September—that is a 3.5 million-barrel-a-day shortfall in September.

Secretary WATKINS. That is the result of the 4.3 million-barrels-a-day shutoff.

The CHAIRMAN. Yes, I understand that. Now, the question is, that is being made up from excess stocks?

Secretary WATKINS. Well, that includes the stock drawdowns that are underway. But it does not project any stock drawdowns. So there are more stocks to be drawn down, but not a lot. In the United States, for example, we will be down to normal levels in October.

The CHAIRMAN. All right. So that by October, when you have almost 2 million barrels a day, will there be a shortage at that time?

Secretary WATKINS. It is hard to say because we believe that with the efficiency measures that we have outlined here, which are being mirrored in the other 21 IEA nations, we can overwhelm those standpipes and bring them down to near zero. In other words, we do not know yet what the impact is going to be.

We also did not realize that in our country we had a more than 200,000-barrel-a-day capability to expand. We are going to get 250,000 by the end of this next quarter.

The CHAIRMAN. Have you put all that in?

Secretary WATKINS. Yes, sir, that is all in there.

The CHAIRMAN. The point is that in September you are short 3.5 million, but you make that up by, in effect, surplus storage.

Secretary WATKINS. What I do not know is the other 20 nations that are involved in the IEA, whether or not they have been able to enhance their oil production above the stated technical capacity which we have in our documents.

What I am saying is we exceeded it. Many others are saying they can exceed it, too. And we probably have underestimated because of our desire to be conservative. We do not have any projections that are overstating technical capacity in here for oil production. So I believe that also will deflate some of those standpipes.

The CHAIRMAN. In October and November, and on out in there, it would appear, your chart would indicate, that we will actually have a supply shortage.

Secretary WATKINS. I think that what I can say is this, and I think we all agree with this in the interagency work that we have done, that the fourth quarter of calendar 1990 is the transitional quarter with the new production coming on line, efficiency measures taking hold worldwide. And I believe that if we do the fuel switching that all nations have been challenged to do and that sort of thing, that we can deflate those more. So I do not like to say now there is going to be shortage, because it is a self-fulfilling prophecy.

I do believe we can manage this. And we can manage it through efficiency measures and through further enhancements, such as fuel switching, that we are not now calculating.

The CHAIRMAN. You hope to avoid this by additional steps?

Secretary WATKINS. Yes, sir, we do. But by having said that, Mr. Chairman, we should all be aware that the President has said, I am going to watch this, I am going to work with the allies. And I have no—

The CHAIRMAN. I understand. My question is if you cannot avoid the shortfall, under what circumstances would you release the Strategic Petroleum Reserve?

Secretary WATKINS. I think we have kind of gone through the criteria.

The IEA in the middle of August directed all nations to put in the necessary documentation to start the process of analyzing worldwide stock draw-downs. Local and regional shortages, worldwide shortages and all the detailed data necessary to make a projection on whether or not the Strategic Petroleum Reserves should be utilized.

The Board of Governors will meet in the latter part of September, in another 2 weeks, and I think that will be a very key meeting in which the data presented from all nations in the world will be brought together and we will make a determination at that time of whether or not the measures that we have all agreed to are doing the job.

For example, we enhanced oil production in the world by 1 million barrels a day in August that we had not anticipated. The market itself just drove it back up again, and that was helpful.

So we need to look at that and not jump into the situation too prematurely. Work the SPR, if in fact we can see that the worldwide stocks are coming down, continue to come down—and they are right now, at least at the last look. We are not building up excess stocks or hoarding, in general, across the world, as far as our data is showing right now.

Now, whether that continues, as the stocks continue to draw down and winter is upon us, I am not sure. The behavior normally is that people build stocks. They do not draw down below normal levels. They do not get even close to minimum operating levels, and I do not think they should. But normal levels will be reached generally, worldwide, in October, so I would say the end of September meeting of the IEA will be the critical meeting to take a hard look at whether the integrated stock drawdown of all nations is necessary, and we will be a major player in that.

The CHAIRMAN. I will save my other questions for Secretary Moore. Since you have to leave so early, I think Senator Burns was first on the Republican side. Senator Burns, and let us try to—since there is limited time, let us keep our questions short.

Senator BURNS. I will do that.

Thank you, Mr. Secretary, for coming this morning. Thank you, Mr. Chairman.

I am not really, I guess, satisfied with what would trigger our draw-down in the SPRO. We were in the Middle East just a couple of weeks ago talking to some people over there, and there is no doubt that the supply could be made up by the Saudis and the Emirates.

They can do it, but it is going to be at a price. We know that, and we are in a situation in this country right now where we have Agriculture in the business of putting a crop in and trying to get a crop out. The price-gouging thing is a matter of concern in my State. But I just do not understand what triggers the Department of Energy to really start going into our Strategic Oil Reserves, our petroleum reserves.

Secretary WATKINS. If, for example, Senator Burns, you were unable to dampen out those standpipes, it may well be that in the fourth quarter there would be a need to draw down.

In other words, if the data shows that we are not making that progress, then we would probably want to move because that is a time when you really do have a stock shortage. That is going to be the most important trigger, in my opinion, the inability to enhance oil production throughout the world, combined with the inability to conserve oil means the demand out there would still be great.

The shortfall that we show in that fourth quarter, I think that could trigger it off, and so it is going to be a stock issue. What are the stocks doing? Are people beginning to stabilize and not draw down any more? Do we have the production on line? Was what was promised actually there? Those are the kind of things we are looking at right now almost on a daily basis.

Senator BURNS. Well, I always looked at our Strategic Oil Reserves as something that we hold in the event of a situation that would threaten national security. Maybe not economic security, but I mean in the event that something happened in this Nation that would cut all pipelines, and I am reluctant to go into those reserves as long as we have some supply, or some commitment made from the exporting nations that they are going to try to pick up that supply. I am reluctant to go into those reserves knowing that, as the world is today, that that reserve is very important to us.

Secretary WATKINS. We should be cautious about it, Senator Burns, along the lines you have suggested, and I think all nations feel the same way. We have about half of the government-owned strategic oil reserve stocks in the world. The other half owned by the other member nations is primarily vested in Japan and Germany.

Right now, most of the other nations are very hesitant to move into an integrated stock draw but they are all ready, and they are all concerned, and they are all reviewing this situation just as we are here today, and I think that what we have got to remember here is that a unilateral U.S. drawdown does feed the world market and will have a price impact, but it is a finite set of reserves.

Also, we do not want to have that fungible commodity being misused anywhere else in the world. We want to stay with the shared burden, you might say, of a drawdown. We also have a limited number of times you can draw down that reserve, and so it is not something you want to be in and out of. When you start, you want to draw down, you want to know what your rate is. You want to know how long you are going to draw down, and then you can measure the downstream damage that you might do in certain of the cavern areas. So I think that there needs to be caution, but by the same token we are not going to foot-drag, and we have been very, very vocal in the IEA discussions about readiness to do just exactly what you are suggesting.

Senator BURNS. One other question, and I know you are on a tight schedule. Even with the amount that we have in SPRO today, and if we use that to more or less control prices, or to keep them from going up, as it has been suggested by some people in this country, I do not think we have got enough in the reserve to really have an effect on what retail prices are.

Secretary WATKINS. Well, actually, a unilateral Strategic Petroleum Reserve drawdown by the United States would have an impact on the world market price, without any question.

The question is, is that the objective here, or is it to manage the world-wide stocks to avoid having to do that, because that is a cherished reserve that has a finite life, and we do not want to mis-use it or use it too early, and we all agree to that.

I cannot tell you how important this event has been to bring the International Energy Agency nations alive in this whole area. They are serious about this business. They are monitoring for the first time. We are all talking the same language. We are very comfortable with the positions that the United States has taken there, and their acceptance in the IEA, and so I do not think any of us want to use it too quickly because it is a finite reserve. We want to use it when it is necessary, and we believe we have time to work the problem with about a 16-day lag time once we actually execute, to get that oil in the pipeline.

Today, the pipeline is full. We could not push that oil in the pipeline right now. But it will not be full unless we can solve the problems of managing those particular standpipes. That will be the measure of our success in managing this thing internationally.

But I will tell you the cooperation and the management is a result, I think, of the political and military cooperation, which fed over into the IEA process and is very powerful, and I am convinced that this international collaboration is essential in an integrated stock drawdown of this type. It will affect world market prices for the longer haul.

Senator BURNS. I have more questions, Mr. Chairman, but in the interests of time I will withhold those.

The CHAIRMAN. Thank you.

Senator Conrad.

Senator CONRAD. Thank you, Mr. Chairman, and welcome, Mr. Secretary.

The President said in his speech the other night that we will not tolerate profiteering. You have echoed those comments yourself here this morning. I am wondering if the new earnings statements come out of the major oil companies and they show a surge in profits—25 percent increase, 50 percent increase—what will you propose that we do in that event?

Secretary WATKINS. I hate to "what if," because I am going to get into trouble if I start "what if," but after talking with the leadership in the oil industry, and as I mentioned, the sincerity and the strength of conviction that I heard, nobody wants to get back into the situation we had before, particularly them, and so I think that they are taking the necessary steps out there to monitor themselves, and right now we do not see across-the-board gross unfairness being applied. We see normal market response.

Just as we found with the heating oil crisis last year, immediate charges of profiteering at the expense of the consumer were levied. When we actually went through the analysis, we found out they had the greatest loss they have ever had. They had a 30 percent loss because of the heat that we had in the remainder of the winter.

So I guess what I am saying is, I think we are premature, in my opinion, in assuming that the market response is not a normal response. I think it is, and I think that they are going to open their books, if they are asked to open the books, and show us what has happened, and I believe that they are as sincere as we are.

They do not want to get in that mess that we had before, and we certainly do not want to set up a huge bureaucracy again. We have gone through \$7 billion of excess profits that we have redistributed to States with a massive organization, with generating more lawyers in the country, and I do not think any of us want to go back through that again, and I believe they do not either, so I would like to think that—let us not accuse them too early of profiteering. Let us see what the books show, and if they do profiteering, then we ought to hammer them.

Senator CONRAD. That really is the question. What if the books show a tremendous surge in profits? Then what do we do?

Let me just say that in my State there is a lot of, I would say deep anger, that there is a sense that somewhere, somebody is profiting when this country is in trouble, and segments of this economy are in deep trouble, and what do we do if there is a dramatic surge in profits? What will your proposal be at that point?

Secretary WATKINS. Well, I really do not know that I am going to be the one who is the sole arbiter of that thing.

I certainly would be enraged, and the President would be, and I think that whatever actions we would take would be very consistent with both the congressional and executive level feelings about this thing. We have taken tough actions before on profiteering and excess profits, and I think that we would have to go back to something like that.

I would like to think that that is going to be somewhat limited and localized, and I hope we do not throw out the entire industry because of a few percent that are going to always profiteer and take advantage of crisis situations.

I know they are out there. We have seen it now in arms, going around the embargo system. We have just seem some leaks in the system by irresponsible entrepreneurs that are going to get in the act, and we clearly ought to lower the boom on them as hard as we can, and that is the kind of thing we are watching for right now.

The CHAIRMAN. Would the Senator yield on that point?

Senator CONRAD. Yes, I would.

The CHAIRMAN. You know, this is a very, very serious question, this question of price gouging, and we may be suddenly faced with this issue on the floor.

I would like to be able to prevent price gouging, but the last thing I think that we want to do is go back to an entitlements program that hamstring everything we do, that creates a huge bureaucracy that lasts for years.

In ERA, they are still dealing with some of those price problems they had from the early 1970's. Almost 20 years later they are still dealing with those things.

Now, I wonder whether it would be constructive to have a hearing here before suddenly we are faced with this issue on the floor in late September. Somebody brings up a nongermane amendment and slaps it on and says, we want to get the price gougers.

I do not know whether we can successfully deal with that at the hearing level, or whether we should. I would like the advice of my colleagues on whether we ought to deal with some piece of legislation the exact shape of which we know not of, yet.

Secretary WATKINS. I think it is very important, Mr. Chairman, that the lead agency is the Justice Department on this, and that under any circumstances the Attorney General should be asked for his opinion on this, because we are taking the lead from the Attorney General, working with him and with other agencies, and he has the lead for the Federal Government.

So I really ought to defer to the Attorney General for his answers to this, because he has got a whole antitrust division. He has got other people monitoring the situation, and they are really the key lead for the Federal Government.

Senator CONRAD. Maybe, Mr. Chairman, I could just conclude on this point by saying I am very concerned. I will tell you, there will be universal outrage if we see a tremendous surge in earnings by the major oil companies at this time. And I would urge you to start thinking of what your response is going to be. Because if we see that, the American people are going to be demanding action, and we ought to know what is it that the administration will propose in the face of that anger.

The last thing we want to do is create a problem which makes the underlying situations worse. I do not think any of us want to see a new bureaucracy. I do not think any of us want to see precipitous action that makes the problem more severe in the long term. But I think we are going to go have to have a legitimate response if we see evidence that in fact people are profiting beyond what is reasonable in this situation. And I hope the administration is ready with a response.

The CHAIRMAN. I think your comments are very well put, Senator Conrad. I would like for you to be communicating with me and with the staff on what we might do, so that whatever is done is the right thing and not the wrong thing.

Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Mr. Secretary, I want to welcome you to the hearing. And I also want to take this opportunity to thank your Assistant Secretary, Henson Moore, for the hearing that he held last week in Fairbanks, Alaska. I think it was a very timely, and it covered energy policy, and was very meaningful from the standpoint of the interests and the input.

Let me first, Mr. Secretary, reflect on a piece of legislation that has passed the Senate. It is an amendment which I offered, the National Energy Security Act of 1990. It was attached to the Department of Defense authorization bill, and provides basically a vehicle to address the question of alternatives and priorities. And I might add it has 16 cosponsors, many of whom are on this committee, including Senator Bentsen, who is not on this committee, but had significant interest in this legislation as well.

What it does is it sets a triggering mechanism that if our imports exceed 50 percent during any 6- to 12-month period, the mechanism is triggered and requires the President to develop an action plan, very similar to some of the comments that he made in his address

to the Nation the other night, covering various alternatives such as conservation, incentives, the conclusion, potentially, of alternate fuels, opening OCS areas, releasing public lands, with the exception of parks, that have been held for various reasons. It would include ANWR, opening up marginal fields, tax incentives to bring on stripper wells. All of the above.

What it does at that point is it forces Congress to make the hard decisions, because the President's recommendations have to come back to both Houses, and they make the recommendations. Then, theoretically, you can address the mandate of the President, which is to lessen the dependence on imported oil. I would appreciate any comments you would care to make. Because, as I understand it, that is the only legislative vehicle that has currently passed the Senate, at least, and is going to conference. And I understand it will be introduced in the House, as well.

Secretary WATKINS. Well, when you and Senator McClure proposed this in early August, Senator Murkowski, we reviewed it and obviously we are supportive of the proposal. We would hope, however, that if that is to go through that we do not have bells and whistles hung on it that have certain mandates and other things that are added that could undo it. In other words, as it is currently worded, we are supportive of its intent and what you are trying to do. I think it is the first time that you have tried to put a finger on what does it mean and what is the national security impact of exceeding 50 percent. This has not been done before.

So I think it has a great deal of merit. I would just hope that the mischief that might be done with it for other purposes as it goes through does not end up making it an impossible situation. If it is clean, if it moves that way, we would be supportive.

Senator MURKOWSKI. The intent of the legislation is simply to provide a vehicle to address the alternatives to force an action program to prioritize all the alternatives, including energy savings, alternative fuels, and then proceed with an action plan which forces Congress to make those decisions. Because clearly we are not going to be able to do it all through conservation. As you pointed out, we can do a better job, but we are going to have to look to alternative sources and we are going to have to look at domestic programs such as you have outlined there. And this would hopefully accommodate your national energy plan, which will—

Secretary WATKINS. It is very consistent with the National Energy Strategy, and this is of course why we are very supportive. And through all of the hearings we have had so far, it is consistent with the information that we heard across the country, and with the documentation that is coming from the States and all the other individuals and entities that made inputs. Therefore, I think we can say that it is very supportive of the national energy strategy and fits within that context.

We can probably be in a position by spring, after the President approves our strategy and we get it up to Capitol Hill, to have a mechanism in place then to take your amendment and really work it right, which we might not have had, had we not started this 15 months ago.

Senator MURKOWSKI. Let me refer very briefly to two other items. I notice on your measures to increase production you have

got Prudhoe Bay production 100,000 barrels a day. It is my understanding that they anticipate increasing up to 225,000 by the end of the year.

Secretary WATKINS. I think there is a discrepancy there, and I do not think any of us are saying the wrong thing. The total of 226,000 barrels a day, when we are working with the majors out there, included 86,000 barrels a day of oil that was not being pumped because of down time on equipment and upgrades that were being made. So that was already in the capacity. In other words, that was not new capacity; 140,000 is new capacity.

We have put up 100,000 because we are trying to average that over a period of time. It is my understanding that the normal declines in the Prudhoe Bay complex will eat up that 40,000 in the time frame we are talking about in here. So what we are trying to do is say this is the real net gain that we will have in the total system, if that makes sense. So all the numbers we can rack up from 100,000, to 140,000, to 226,000—

Senator MURKOWSKI. Let me briefly refer to your projections on Niakuk and Point McIntyre. You are aware that Niakuk has basically been stymied by the Corps of Engineers refusal to grant the permits. It is my understanding that BP has pulled back on the project, knowing that under the current circumstances those permits will not be forthcoming. Is there any program to expedite the permitting process, because this issue is over on the causeways and—

Secretary WATKINS. Yes, sir. This is one of the many. And the reason that is up there is because we want to focus on that, just as we are doing in the Point Arguello production situation. And after the Deputy Secretary's trip to Alaska, which was very productive and essential to our understanding of the variety of situations up there, we are going to ask our General Counsel, who is helping arbitrate the decision at Point Arguello, to come to Alaska to meet with both sides and see if we cannot help facilitate that situation and bring Niakuk and Point McIntyre on line.

So we are in the middle of that.

Senator MURKOWSKI. I just wanted to make sure you were aware of the difficulties in permitting, because the Corps has been absolutely impossible. They are running amok. And to get any permitting through—

Secretary WATKINS. Well, we have an incentive now to override some of the bureaucrats.

Senator MURKOWSKI. Well, I hope, Mr. Secretary, you can get the message through.

The last question I have is what does filling SPRO have to do with the price increase, since we are pulling down on the available supply of oil? You are saying we are going up from 750 million to a billion, and we are doing it at a time when the supply is shrinking. We are already 4.3 down in the availability of oil. So we are pulling it down to put it in the ground, when we should have done it when there was an excess, but hindsight is cheap.

Secretary WATKINS. Well, of course the "you" in this case is the Congress, Senator Murkowski, not the Administration.

Senator MURKOWSKI. Oh, I understand who you is. It is us. Pogo had something to say about that.

Secretary WATKINS. On the other hand, I think, in view of the current situation, I do not find a lot of opposition around town—

Senator MURKOWSKI. But what does it do to the price when we suddenly take a commitment and pull from 750 million to a billion and put it in the ground? We are pulling on the availability of whatever the quantity of oil is out there.

Secretary WATKINS. We do not fill at all during disruptions. As a matter of fact, we terminated fill with the last delivery that had already been prepaid and earmarked for SPRO. I think it was a 3-million barrel add-on in August that was already earmarked for that to take it to 590 million barrels. So there is no oil going into SPRO right now under this situation. So we are not adding oil right now.

Senator MURKOWSKI. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Secretary, somebody on your behalf has just sent me a note and said Secretary Watkins must leave now, with the now underlined. So those who manage your life say you must leave now. We have enjoyed having you.

Secretary WATKINS. Thank you very much, Mr. Chairman. I will turn it over to my very able Deputy Secretary, who might have better answers than I do on most of these things.

The CHAIRMAN. Thank you very much.

Senator MURKOWSKI. May I ask my last question of Mr. Moore?

The CHAIRMAN. Yes, of course.

Senator MURKOWSKI. Would Mr. Moore care to comment in 30 seconds or less on ANWR?

Mr. MOORE. We all heard the President's speech on Tuesday night. We are very pleased by it. The time that I spent up there in the last week of August was very interesting. We spent 2 days up there. The position of the Administration is that we are now willing to work with the Congress to try to move that legislation forward. I think everybody has the same concern of doing it in an environmentally responsible manner. And after being there, I think that is entirely possible. And so the point is that the administration has made a clear statement, from the President himself, that he is ready to move forward with the Congress.

Senator MURKOWSKI. When you say now, do you mean in this session?

Mr. MOORE. Yes.

Senator MURKOWSKI. I have no further questions, Mr. Chairman.

The CHAIRMAN. Senator Bingaman.

Senator BINGAMAN. Thank you, Mr. Chairman.

Mr. Moore, let me ask you a couple of lines of questions.

First, I have been concerned that the price of gasoline about which a lot of my constituents are upset has been driven by the spot price of oil. The spot price of oil has been driven by the futures price on the Mercantile Exchange. I wonder to what extent the Department of Energy has assessed whether the Mercantile Exchange futures market in oil is operating as it should and whether it is a problem area for us.

It seems very simple to me that people who would benefit from the price of oil going up could get in the futures market and bid it up and then see that translated into the spot market and then see

that translated into the price of gas and then say, well, we have no control over it, this is the free market at work.

Could you give me your response on that?

Mr. MOORE. Senator, first, I would agree with your basic premise. There is no question that the price of oil today that you are seeing, whatever it is today, in the \$31 range, has nothing to do with supply and demand. It is strictly a psychological price, and the spot market is being driven up by anticipation of shortages of oil. As the standpipe chart shows, we really have not seen the shortage. It has not yet hit in terms of the oil we lost coming from Iraq and Kuwait.

So you are correct. We agree with you that this is an anticipated thing, a psychological thing.

Now the specific question of whether we have studied how the Mercantile Exchange is working in this matter and if we are satisfied with it, let me ask Cal Kent, who is the Administrator of the Energy Information Administration, to come and answer that part of the question. He is the one who is monitoring and following this.

Mr. KENT. We are in the process of monitoring this. We have seen no indication yet that the spot market has in any way performed unusually or has been rigged. It is just a situation where the spot market has probably been stabilizing the market because your situation with both spot and futures is that anytime one person makes money, another person has to lose money. It is a zero sum game, and all of our evidence indicates that nothing has changed.

Senator BINGAMAN. So basically you have no problem with the way that the price has been fluctuating on the futures market and the way that that has translated into changes in the spot market and changes in the price of gas?

Mr. MOORE. No, he did not say that. We are saying it is operating as it normally does in the market. Sure, we have problems with it. We would say the same thing of the stock market or the futures market in agricultural commodities. We would much rather see these markets respond on supply and demand in normal things and not whether or not Hussein gets up with a bellyache one morning.

That is precisely the way this thing has been working lately. If he lets a few hostages go, the price comes down. If he makes a belligerent statement on television saying that he is going to do such and such, the price runs up. Nothing has to do with supply and demand.

No, we do not like that. We think that it ought to be responding to real facts and not that kind of nonsense.

Senator BINGAMAN. I gather there is no thought or intent to do anything to try to in any way restrain the market from responding to how many hostages are released?

Mr. MOORE. Senator, talking in terms of new forms of legislation that would give somebody in the Federal Government the power to intervene in these matters, no, we have not. I rather imagine that would not originate in the Department of Energy. It would come from some other department of the Government.

Senator BINGAMAN. Let me ask on another line of questions here, the President in his speech two nights ago said that Congress should this month enact measures to increase domestic energy pro-

duction and energy conservation. I understand that on the energy production you have the proposal for a temporary increased tax credit for drilling, and I understand you would like us to pass the ANWR legislation and WEPCO.

What is the President or the administration asking Congress to enact to increase energy conservation?

Mr. MOORE. At this point I am aware of no legislation being submitted by the Administration or going to be submitted by the Administration on conservation. In the program or plan that we just handed out to you this morning and which the Admiral announced this morning, of the 14 new intermediate or medium-term measures or initiatives we are taking, we outlined 6 additional items we are taking in the energy conservation area. None of those at this particular time require legislation.

We look to that as being part of the National Energy Strategy, the long-term game plan of things that will—

Senator BINGAMAN. When is that due?

Mr. MOORE. That is due on the President's desk in December, and it is our assumption that he will be making a report as we are required to do under existing law to this committee by April of 1991. I think that is the absolute deadline.

Senator BINGAMAN. Have you considered accelerating that in light of what has happened in the Middle East?

Mr. MOORE. Yes, we have. Much of what we have done on August 15—the 9 items we announced then—and the 14 items we have announced today came out of the work that has been going on for a year and a half on the national energy strategy.

The problem, Senator, is that an awful lot of those items are still going through a great deal of study, and most of them are long range, where even if we announced them and did them today they would not really have an impact on the situation we are looking at here today regarding what you do for an interruption of Iraqi and Kuwaiti oil. Over the long term they would make a tremendous impact.

So we have reconsidered and determined that much of the work we are doing today has been able to be done expeditiously in a matter of weeks instead of months because of the work that has gone into the National Energy Strategy, but the real strategy itself really would not have an impact on what we are facing here the rest of this year in the fourth quarter of 1990.

Senator BINGAMAN. So when the President said in his speech that he wants us this month to enact measures to increase energy conservation, that was just a misstatement?

Mr. MOORE. Well, I am unsure. We have some additional items that are being considered by the White House, and maybe he was referring to those. We just do not yet know. We know that what we have had cleared as of this morning is before you, and I see nothing in there that requires additional legislation.

Senator BINGAMAN. Let me just say this and then give you a chance to comment. As you know, I have great respect for Secretary Watkins and you both. I have to say that the response that you are proposing today to the energy problems of the country seems to me to be woefully inadequate considering the magnitude of those problems.

I certainly encourage more air in tires and better driving techniques and all of those things. I know you have a public relations campaign that starts this week encouraging people to do better, and I think that is good; but I do not think that is going to get us from here to where we need to be.

It seems to me some difficult decisions are going to have to be made in order to make any real progress in conservation, just as difficult decisions will have to be made to make new progress in increased production. I see nothing in what you have proposed that begins to be a difficult decision. It is all things that we should have been doing for the last 10 years and did not because we were paying no attention or the administration felt that it was interfering with something, perhaps.

Like the old saying, Where's the Beef, I think that is a reasonable question when you look at what is being proposed by the administration in the way of a response to this crisis.

Mr. MOORE. Senator, the time frame in which you expect a response is what is key here. There is nothing else we can find, and we challenge anybody to give us a hand if they can find something that will have an impact in the next 90 days or 180 days. That is what we are facing.

The frustration that you are expressing this morning we agree with fully over the long term, and that is where the National Energy Strategy will come into play. You will have before you, we trust, every option and every discussion of every problem. You and the President and the American people can sit down and figure out what our strategy is going to be over the next 2, 3, 5, 10, 30, and 40 years.

But in the next 90 to 180 days, we know of nothing that can be done other than what we have come forward with here that will have an impact on the immediate problem of Iraq and Kuwait.

Senator BINGAMAN. I do not disagree. I just make the point, and then I will go ahead and let me colleagues ask question. I will just make the point that in all of these things, in order to get the political momentum and will to do anything and to make tough decisions, you have to catch the wave. The American public is willing to do some things to deal with their energy problems today. If you wait 90 days, 120 days, 180 days, we will be on to something else. If we do not have enough commitment and political will to try to do something when the crisis is on us, it is very doubtful that we will have that down the road sometime at the time a report is issued.

Mr. MOORE. I fully understand. Should committees in the Congress decide to move with legislation such as you envision to catch the wave, we are certainly in the position by the work we have done on the National Energy Strategy to support them and to work with them with the data and computer modeling that we have been doing for a year and a half which we were not in a position to have done a year and a half ago.

I fully agree it would have been much better if this plan was sitting here ready to go and we were waiting for the opportune political moment to enact it.

Senator, you made a comment that I would like to be sure that all the members of the committee and those in attendance here understand. The Admiral left to go to Boston along with Secretary

Skinner where the two of them are announcing today before the National Association of Broadcasters national convention the unveiling of the public relations part of this campaign to encourage people to do things that will have an impact now on the situation of imported oil and refined products.

That is the reason why he left, and we would hope that the Members of the Congress and the American people will find these helpful; we will be able to show in fact that they are working by virtue of polling techniques we will be using afterwards to determine, in fact, what has been the response of the American people to these things. I think that will be helpful to the Congress in determining whether these things can be done voluntarily or whether next year in connection with the national energy strategy the Congress may wish to consider stronger measures.

Senator BINGAMAN. Let me make one other suggestion and then I will stop.

Since the energy strategy is to be completed in December and briefed to the President at that time, this year in the State of the Union address I do not believe the President mentioned the word "energy." Last year in the President's State of the Union address I do not believe he mentioned the word "energy." If you could get that to him so that he could talk about it in the State of the Union address this next January and present it to Congress in January rather than in April, I think it would be of great benefit.

Mr. MOORE. I appreciate that, Senator. That is an excellent suggestion. We are very pleased by the fact that the President did speak of this Tuesday night, and I think that we can look forward to what you suggest.

Senator BUMPERS [presiding]. Senator Nickles.

Senator NICKLES. Thank you, Mr. Chairman.

Mr. Moore, it is a pleasure to see you before the committee again.

Let me make a comment and kind of follow up on what Senator Bingaman said. I think certainly there is a consensus in Congress now to do something, but I will be very frank, I hear a lot of people talking about doing something that in my opinion would do a lot more damage than good, and I think it is vitally important that we learn from history, and not repeat some of the mistakes that were made before. I have heard my colleague basically imply that they wanted to have price controls. And some have introduced legislation calling for a windfall profits tax. Those would be serious mistakes.

I did not hear those colleagues speaking at the same time when the price of oil went from \$25 to \$9.25 in 1986. I did not hear those colleagues speaking up when we had the number of active rigs in this country falling from 4,000 to less than 1,000. We did not hear any of those comments when the number of independents were basically decimated in the States of Louisiana, Oklahoma, and Texas, and in the producing areas.

So a lot of these so-called solutions that now people want to talk about, we have to be very certain that we do not make mistakes. And certainly price controls and windfall profit taxes, those would be giant steps in the wrong direction. We see the rest of the world, including communist countries, moving towards a market system. I

hate to see my colleagues that are trying to move towards greater Government controls. And we see that not only with the two items I mentioned, a windfall profits tax, I have greater support now for synthetic fuels. I want synthetic fuels, but we do not want to have it come with a massive Federal bureaucracy and subsidization.

We are going to be dealing, possibly today, on the floor of the Senate with another Federal control called CAFE, corporate average fuel economy where, again, some people, in the name of conservation, are going to come out and say we need to have a Federal law to mandate that all automobiles by the year 2,000 will average 40 miles per gallon or more.

Mr. Moore, what is the administration's position on the Federal mandate of CAFE standards?

Mr. MOORE. Senator, a letter was just signed this morning that will be distributed to each of you by Secretary Skinner and Secretary Watkins that both repeat what has been the Administration position, which is in opposition to that. The Department of Transportation has very serious concerns about safety, about reducing the weight of automobiles further, and what that will do to the safety of the occupants in them.

Senator NICKLES. Am I correct in saying that the President will veto the so-called Bryan bill?

Mr. MOORE. According to this letter, certainly Secretary Watkins and Secretary Skinner will very strongly recommend a veto to the President of the United States.

Senator NICKLES. I have a letter from him that says that he will veto it, and I hope so. Because that is exactly the type of measure that we do not need, again, this greater Government mandate and regulation that is a step in the wrong direction. A fuel use act was a step in the wrong direction. We spent several years undoing several of the items in the Carter administration, the so-called Carter energy plan, that were mistakes, and maybe well intended. But we need to do some positive things.

And, Mr. Moore, as you know, I have been critical of the administration for this study that has been ambling along now for about a year and a half with the report due to the President in December. I told you very specifically and I told the Secretary of Energy that we did not have that much time. I remember when he proposed it, I remember when you had your first hearing in Oklahoma. I said we do not have that much time. We know what needs to be done. And I know that you know what needs to be done.

And frankly, the time for studies has passed. We cannot afford to make the serious mistakes that we made in the past, whether it be a windfall profit tax, or price controls, or CAFE, or the synthetic fuels corporations. But we need to do some positive things. We need to enhance domestic production. And I was pleased to hear the President say that, and I know you have a list of items, and I do as well, that could really help domestic production.

In my State along in the last 5 years, production in the State of Oklahoma has fallen from 450,000 barrels per day to 290,000 barrels per day. So you see we have had a draconian reduction. That is primarily because of price. Because back in 1985 we had prices around \$25 and plus. Since then we had the prices really fall down

to the bottom in 1986. And as a result, you had a lot of marginal wells that were shut in.

So I hope a lot of this attention will be focused on trying to enhance the recovery from stripper wells, marginal wells, the wells that are owned by independents. Those are not people that are making millions and abusing the consumers of this country.

So there are several things, as you know and I know, that we can do to help enhance domestic production. We also need to enhance nuclear power, and I was pleased to hear the Secretary say something about Shoreham. But it makes no sense to have Shoreham and Seabrook closed. Plants that are ready to go, ready to produce, that could reduce our dependency on imports. And there is no excuse in my opinion, for an extended and continued OCS moratorium.

Now I was displeased with the administration when they called for an enormous box to be put into an OCS moratorium. We need that production. And frankly, the OCS production, as you are well aware of, being from the State of Louisiana, OCS production is not a cause of the environmental problems. Those are from tankers, not from offshore platforms. So I would hope the administration would work with us on the appropriations committee, and I see my friend Senator McClure and also Senator Johnston are on that committee. We need to work to see that the moratoria legislation does not continue to grow.

We need to do positive things.

Senator BUMPERS. Would the Senator yield for a question? I will not charge you for the time.

Senator NICKLES. I would be happy to.

Senator BUMPERS. I remember when we were debating the decontrol of oil prices, and we had all those charts on the Senate floor about how production would be 2 million barrels a day more by 1990 than it was then. And we decontrolled oil prices and today production is down by 2 million barrels. Now my question is, does the Energy Department have a projection of what price oil has to go to, in other words, how much increased production we would get in 1991 at \$30 a barrel? How much would we get in 1992 at \$40 a barrel, and so on? I want to know what the effect of higher prices is on production in this country.

Senator NICKLES. Let me answer just a part of my friend and colleague's question if I might. And I know the question is directed to Henson, and that is fine.

Senator BUMPERS. I was just trying to follow up on what you were saying. I did not mean to change the subject.

Senator NICKLES. We decontrolled oil, and this Senator was one that said if we decontrol oil and really allow the marketplace to work, you are going to see consumers benefit. And I think, quite frankly, you have seen that happen. You saw prices decline in the 1980's. We also made the same argument when we debated and the passed the bill that I offered with others on this committee to deregulate natural gas. And when we did deregulate natural gas you actually did see a price decline.

When you have deregulated markets you will see prices respond to supply changes. And I think we have seen that. And frankly, I heard questions dealing with the futures market. Sure futures are

speculative. That is the whole nature of futures markets. And they have a purpose. We have had more price changes in the last—well, we have a price change every day. But that is not all that inherently negative. It is just the fact that yes, in a market system it does respond to speculative changes.

But in the long run, I repeat, in the long run, consumers will certainly benefit in a deregulated market. And I think history has proven that both in oil and in gas.

Mr. MOORE. Senator, yes, we can certainly furnish your office and the committee with projections from the Energy Information Administration on whatever price levels for whatever time period you would like to see that would give you the best information that we can come up with, and what that might do.

[The information follows:]

Attached is the Energy Information Administration's (EIA) latest Short Term Energy Outlook.¹ This Outlook contains projections of supply and demand made with three different price levels. These price levels are \$20, \$25, and \$30 per barrel. Should the committee want any additional analysis, it will be made available after the assumptions are provided to EIA.

Senator BUMPERS. Do you have anything you could share with the committee right now?

Mr. MOORE. No, I do not think we have those figures with us at this moment. But let me say this. First of all, we are not seeing and we are not counting any kind of increased production right now by virtue of the price, as any prudent businessman, whether he is a farmer or whether he is a carpenter or whatever, is not going to start doing something based on today's prices, as everybody knows these are price spikes. They are temporary aberrations in the market.

So we are not expecting any increased production from the current price we are seeing now. It has to be a price that people believe is going to be there for a while.

Number two, in this standpipe chart we have shown you, we have not counted any of that. There is no anticipated price response on production in this world petroleum supply loss for that same reason.

And thirdly, I would simply conclude by saying that we are going to see a net decline in production of oil in this country, Senator, unless the price is just way high, because of the fact that our fields are basically depleted and they are declining in production. And certainly a stable price at a higher level would reduce that rate of decline. But you would probably want to know what would the price have to be so that we do not lose any more production on a net basis and actually increase it. And we can give that to you, and I expect it would be a pretty high price.

Senator BUMPERS. Mr. Secretary, that has been my firm belief, and I am glad to hear you say it. And I think the people ought to reconcile themselves that no matter how high the price goes we are going to have a decline in production. It is just a question of how fast the decline is going to occur.

Mr. MOORE. It could get to a point where there would not be a decline, but I think that is a price nobody sees happening.

¹ Retained in committee files.

Senator BUMPERS. Thank you, Senator.

Senator NICKLES. Thank you, Mr. Moore.

Senator BUMPERS. Are you finished?

Senator NICKLES. Yes.

Senator BUMPERS. I think Senator McConnell is next.

Senator McCONNELL. Secretary Moore, I just want to say that I was pleased to see that Bob Gentile, the Assistant Secretary for Fossil Energy, is just back from Poland, exploring with them ways of expanding the export of clean coal technologies. And I want to commend you for your interest in clean coal technology. And I was pleased to see that trip to Poland. I think that is exactly the sort of thing that we ought to be doing.

With regard to the Secretary's testimony earlier about these dramatic increases in prices for gasoline, you said a minute ago that it had nothing to do with supply and demand, it had to do with the psychology of the markets. For the sake of argument, let me accept that, that it had nothing to do with supply and demand. There is no shortage, but we are still suffering from these gasoline price increases.

I am wondering, Mr. Moore, what would reassure the speculators? America has got, as some have said, close to 200,000 troops there. The rest of the world is allied against Saddam Hussein. It is clear that at some point he will lose. You cannot defeat the rest of the world. And everybody, with the possible exception of Iran, is allied against Iraq.

So I am wondering why there is this psychological feeling out there in the market that somehow there is going to be a shortage when there is absolutely no evidence that that has occurred in the past and is not going to occur in a major way in the future because of this substantial worldwide opposition to this particular individual?

How do you explain this psychology that is wreaking havoc with the markets?

Mr. MOORE. Senator, I agree with you that we do not believe that there is a reason for the market to be behaving as it is. But how do we explain it any more than we can explain the stock market or the commodities exchange and how it operates? It is a market that is based on traders and who knows what goes through their minds when they make their trades every day.

You are correct, the United States has made an outstanding, historic commitment to seeing to it that this does not spread into Saudi Arabia and the world loses production of oil there. I would think that most rational people ought to come to the conclusion that that is not going to happen. And we have also seen the world respond in terms of increasing production, as this standpipe shows. And that ought to reassure those markets that we are looking at what the United States is doing in terms of encouraging people to reduce consumption and to switch to natural gas and coal where it is possible, off of oil, and to increase production of oil.

And already we have seen almost a doubling of what was anticipated in the increase in production in the United States than what we were figured for. We were figured for 100,000 barrels by most analysts. We are well above that, and we will be hitting, I think easily, more than that by the end of the year. So all of these things

ought to be reassuring the market. But the market is the market, and we have given up trying—not that we have ever tried—to gauge our governmental policies based on what the market is doing. We are trying to simply come up with the facts, and hopefully the market will some day learn those facts and behave differently.

Senator McCONNELL. Well, the fact of the matter is, obviously, whether or not Government intervention is ultimately the appropriate response, somebody is ripping us off, because there is no reason for this psychology. And never has there been this kind of massive worldwide intervention in opposition to naked aggression, never in the history of the world. I cannot imagine why that would not reassure anyone as to the future outcome of this particular—

Mr. MOORE. Well, on the other hand, we do not expect this to stay. This is a spike. It is a temporary thing. And it is not going to stay there. Because eventually all those who buy and sell oil will realize exactly what you are saying, and this will settle down to a more reasonable figure. And we fully expect that. We have seen it happen, if you follow the spikes that have happened already, it has gone up and down, and it has been back down in the low 20's and then bounced back up again up into the 30's. So it is the kind of thing that will settle down.

And I venture to say that I would be concerned about legislation that talks about interfering with the market. Because just like the stock market, we saw the day when it crashed 2 or 3 years ago, and it has come back. And the futures market in crops, that sort of thing. Nobody likes these fluctuations, but that is just the natural way the market operates.

Senator McCONNELL. Nevertheless, I think this unwarranted price gouging, whether or not it meets the legal definition for that, is despicable, and I think all of us are looking forward to hearing the Justice Department's report on what has gone on here.

Shifting subjects, Mr. Moore—and I do not have to tell you, because you have been very much involved in this field for a long time—we have in this country about 3 percent of world crude oil reserves. At the same time, our coal reserves account for about two-thirds of what we used to call the free world's total coal reserves and over a quarter of the total world recoverable coal.

Obviously, building an energy policy based upon a single fuel source is not very smart, and we are experiencing that. However, it seems to me that since we have been blessed with an abundance of coal we ought to be using it to the maximum extent possible to reduce our dependence on imported fuel. My question is, is there any potential for displacing imported oil with domestic coal that we might be, perhaps, overlooking at this time?

Mr. MOORE. We think in the medium term, which is the plan that we have announced today, one of the initiatives is to work with the State Utility Commissions to see what we can do about dispatching, to get away from dispatching electric generation by oil, and in turn to have utilize dispatching of electricity generated by natural gas, by coal, and by nuclear and by other means.

So in that sense, yes, we think there is a possibility in the medium term, meaning in the next 12 months, to be able to see electricity generated by coal on line to the consumers in place of

oil. But that is a complicated issue, and it is not real simple. You get into costing, you get into a number of things that the Public Utility Commissions have to take into account.

So we are going to be working with them, and have already begun those discussions to see how it can be done, for how long can they allow it to be done, what would be the cost differential to their consumers, to see if that can happen. But the answer to your question is, there are parts of the country where you could back out the use of oil for coal in the generation of electricity in the medium term.

Senator McCONNELL. What current programs do you have underway in the area of coal liquefaction, or gasification?

Mr. MOORE. We have got Assistant Secretary Bob Gentile here who can give you details on that, which I know you are well aware of, but to answer your question those programs are underway. We do not see them as being of any help to us in the short term. That is a National Energy Strategy mid- to long-term proposition (5 to 15 years), and so if you would like more detail on the question, I have got Assistant Secretary Gentile here.

Senator McCONNELL. You might make an observation about that. I would like to hear it.

Mr. GENTILE. Senator, in the last, approximately 20 years, the price of liquids from coal has been dropping from about \$70 a barrel to about \$35 a barrel, per barrel of oil equivalent. We know with some more aggressive research that that price could be brought even lower.

The opportunities for coal liquids certainly are very promising, and we think we can develop ways to burn them relatively inexpensively given the price of oil, and cleanly. The issue is, once these technologies are developed, we need to develop the infrastructure to allow that to happen.

Senator McCONNELL. Is that likely to be featured prominently in the energy policy we will see later this year?

Mr. GENTILE. Yes, Senator, I am sure that that will be looked at very seriously, and given serious consideration.

Senator McCONNELL. Mr. Secretary, is the Department committed to expanding the use of coal?

Mr. MOORE. Senator, that is going to be a decision that you will make in this Congress next year, as this national energy strategy is before you. You will make that decision.

Senator McCONNELL. I am asking how you feel about it.

Mr. MOORE. Well, certainly we feel that coal is the Nation's number one resource, and we believe through our Clean Coal Technology Program it is becoming more successful, that within a number of years in the future, not too far distant out, we will be able to take care of the problem of acid rain from burning coal satisfactorily. And we believe by virtue of the Rounds 4 and 5 of the Clean Coal Technology Program, when we get into increased efficiency from the burning of coal, we will even be able to address the concerns of carbon dioxide emissions.

If you look at the baseline which you will be presented with in the National Energy Strategy, if the country makes a decision it does not want to use coal, there is going to be an enormous gap there that has to be filled other ways.

In looking at all of the various possibilities of increased conservation and energy efficiency and increased use of renewables, all of which are a cornerstone, and will be a cornerstone of the national energy strategy, you still, as we see it—but that is something you are going to have to decide, the Congress of the United States—cannot get there from here. If you just abolish coal, you are just not going to be able to get there from here.

As a matter of fact, we see coal increasing even if you increase the use of nuclear, renewables, and energy efficiency. But this is going to be the baseline laid out in the options that will be presented to the American people and the Congress as to how they want to see the energy picture of the United States of America from now until the year 2030.

But my personal opinion, and that of what we see so far, and what we have built in this national energy strategy and what we will be presenting to the President is, we do not see how you are going to get there from here, if you do not use coal.

Senator McCONNELL. Speaking of renewables, my last area to explore is the question of grain-based fuels. To what extent are you engaged in further research in ethanol production, and where do you see that going in the future?

Mr. MOORE. That is progressing, and during the years when Senator Wirth and I and others were involved way back when all this sort of thing sort of began, he believed very strongly in it and others maybe did not. The research has continued all these years, and in his State of Colorado I think some of the most exciting research is going on in our SERI laboratory.

In that laboratory, just as Assistant Secretary Gentile indicated to you in regards to bringing down the cost of creating liquids from coal, the same thing is occurring in being able to create ethanol from biomass, meaning a crop that a farmer would grow that has no earthly value except selling it to a biomass-to-ethanol conversion plant.

The last time I was out there, which was about a year ago, looking at the figures, before the price of oil was where it is today, the lines crossed at about the time when that process would be competitive with gasoline—with \$15 oil—about 1997, 1998.

We are very optimistic about where that technology is going, and we believe that in the national energy strategy in those out years at the end of this century and the beginning of the next century, that is when you are going to really begin to see an alternative fuel that is produced here in the United States, not imported, and produced from a crop that can be grown and does not need subsidies, begin to really enter the marketplace.

So yes, the research is going on, and we foresee a real future to ethanol in terms of the fuels for vehicles in the future.

Senator McCONNELL. Thank you, Mr. Moore.

Senator BUMPERS. Thank you, Senator McConnell. Just one quick question, Mr. Moore. Is the cost of ethanol today with no tax credits included about \$1.40 a gallon? Is that a fair figure? Or maybe that includes the tax breaks.

Mr. MOORE. I am being told with the tax break it is \$1.60 a gallon, where you are getting to is yes, as the price of gasoline goes

up by virtue of the price of oil, certainly these other technologies become more able to compete in the marketplace.

Senator BUMPERS. How much is the tax credit? If it is \$1.60 with the tax credits, how much is it without?

Mr. MOORE. It is \$1.60 with the credit. The credit is 60 cents a gallon.

Senator BUMPERS. You are talking about \$2.20, or is it the other way around? Is it \$1?

Mr. MOORE. No, the tax credit is 60 cents a gallon.

Senator BUMPERS. So it would cost \$2.20 if there were no tax credits? Senator Nickles was asking about tax credits on ethanol. I want to be sure that the record is straight on this. What you are saying is that if there were no tax credits for the manufacturing of ethanol, the cost of ethanol would be \$2.20 a gallon?

Mr. MOORE. I am sorry, Senator, would you repeat the question?

Senator BUMPERS. If the tax credit is 60 cents, and you say with the tax credits the price of ethanol is \$1.60—

Mr. MOORE. Yes.

Senator BUMPERS. So without them, the actual cost is about \$2.20 a gallon, is that correct?

Mr. MOORE. Well, I am getting conflicting information here. The fellow that can answer those questions just left with the Admiral, and I would suggest that we get you those hard answers, which we can do for you.

[The information follows:]

MARKET PRICE OF ETHANOL

The wholesale market price of ethanol on October 18, 1990, in Iowa, was approximately \$1.60 per gallon. The \$.60 Federal tax credit is taken at the point where the ethanol is blended with gasoline. With the credit, the blender effectively paid \$1.00 per gallon. Although the producer does not directly receive the credit, the price received by the producer is \$.60 per gallon higher than it would be without the credit.

Senator BUMPERS. With or without—if it is \$1.60 a gallon to produce, you are talking about a retail level of something considerably higher than that, and so it is going to be a long time without a massive tax credit by the Federal Government before ethanol becomes very practical, would you not say?

Mr. MOORE. No, Senator. That is what I was just addressing. That if technology stays static, you are correct, but the technology is not staying static. The technology is advancing, and has been advancing very steadily, coming down the cost curve of what you can make ethanol from, this biomass material, and the approach that we are taking is looking forward to the day of when will that enter the market, when it does not need a subsidy.

Just the cost of producing it is competitive with the cost of gasoline, and we are saying that the last figures I saw out at SERI Laboratory indicated that 1997-1998 in the laboratory it would be competitive, and moving that, then, into the commercial sector would take additional years.

Senator BUMPERS. If you have a chart on that, or a graph showing that, what you anticipate the additional technology, if you would please share it with us—

[The information follows:]

COST OF PRODUCING ETHANOL

The total cost of producing ethanol from corn in a modern facility is \$1.10 to \$1.20 per gallon. The Department of Energy projects a 5 to 10 percent reduction in this cost over the next decade.

The cost of producing ethanol from cellulose feedstocks, such as wood, is presently estimated to be over \$1.40 per gallon. DOE research is designed to achieve as low a cost as \$.62 per gallon by year 2020.

Mr. MOORE. We certainly will share it with you, and that, too, will be part of this national energy strategy as to when these technologies can come into play.

Senator BURNS. Would the Senator yield on that just for a second?

Senator BUMPERS. Sure.

Senator BURNS. Senator Bumpers, I think the figures that they are probably basing that on—I would like to see that based on present cost of grain. Grain prices are very low right now, and I am sure that the prices that you have and the work that has been done in Colorado were based on last year's cost of grain, which was about a third higher than they are right now.

So I would encourage that, with that answer, we get some type of recent cost of the product that is going in there, and I would agree with Senator McConnell over here that somewhere in the national energy strategy which has not surfaced to this point that the emphasis upon what we can do with our clean coal technology would also surface.

Because I think there are going to be things coming into this that are going to be very exciting—the technology of fuel cells which are methanol-based, and that methanol can come from coal. Because here in this country we are, in fact—you could call the State of Montana the Saudi Arabia of the bituminous and sub-bituminous coal.

Senator FORD. We already have that, Senator, in Kentucky.

[Laughter.]

Senator BURNS. But I would agree—you know, I go down to Kentucky to buy horses.

[Laughter.]

Senator BURNS. But I would agree that some emphasis in this thing that is supposed to—in this report that comes out in December, and should be before the Congress in April—should bring to light some technologies that we are getting light of and being educated on, be included in that national strategy.

Mr. MOORE. It will, Senator.

Let me address an additional point, Senator Bumpers, that this is getting into the whole area of alternative fuels. The Congress passed legislation in 1988, and I am privileged to chair the inter-agency commission that was created by the Congress working in this area. As part of this medium-term plan, the Department of Energy and the GSA are announcing the purchase of 65 flexible fuel vehicles for the Federal fleet in 1991.

The President is getting ready to sign an executive order to speed that up in the subsequent years with larger numbers of Federal vehicles in that fleet. Also, in that same executive order, he is going to be ordering that we look into the conversion of the exist-

ing fleet—how much of that can be done responsibly—to compressed natural gas, methanol, and ethanol fuels.

Additionally, that same executive order that the President will be signing will be ordering further efficiencies in Federal buildings, on building standards for Federal buildings, and in appliance purchase standards by the Federal Government. So we think there are additional conservation measures that Congress intended years ago, or as recently as 2 years ago, that the President's executive order will hasten and will try to have an effect on the immediate situation we are facing, in terms of trying to back out consumption of oil or be more conservative and more efficient in our consumption of oil.

Have the Federal Government set the example.

Senator BUMPERS. Thank you.

Senator Ford.

Senator FORD. Mr. Secretary, I sit here and listen, about the crisis in 1973, the crisis in 1979, the crisis in 1990; if I had my eyes closed, Senator McClure, I believe we hear the same words we heard all three times. There is no change in it. The only change we have today is SPRO, 600 million barrels. And Congress did that.

You remember the Reagan administration sent SPRO budgets from down there that were zip, that was when oil was at \$10 a barrel and \$8 a barrel. Dad always told me to buy low and sell high, and you guys did not even want to buy when it was low. I hate to see Jim McClure leave here. If there has ever been a voice for some kind of a national energy strategy, it has been Jim McClure.

We have tried, I guess for at least for the 15 years, to come up with something. And I thought we were on our way. It was the moral equivalent of war, and everybody kind of snickered. Now it is real war. If they were selling apples and oranges in the mid-East, we would not be there. I do not care what you say, we would not be there if they were selling apples and oranges.

Now we find that we are going to air up our tires and drive appropriately, and do all those things that are really going to get us on back on the energy policy. But we do not have an energy policy. There is not an energy policy. We have lost it. And it started when we authorized \$80 billion, I think, and appropriated \$20 billion, and spent about \$2 billion of it. Then we had the change of administration and it was cut off at the knees. So in the last 10 years we have not had any acceleration.

Oh, you can talk about nickel and diming some of these operations, and you talk about ethanol. We have a plant down in southern Kentucky, on the Tennessee border. The reason it is closed is because of the price of corn. Corn is too high and the companies will not take it. That plant was built and selling all of its ethanol to one company, Gasohol, you know what it is. The plant is now closed because the Government would not even let them have the old black grain kernel corn in storage that nobody else wanted. You could not use it for anything, but they would not give them a break so they could keep the plant open. So now it is closed.

You too tried to open it, a \$91-million plant. You tried to auction it off the other day, the highest bid you got was \$2.8 million. Is that not right?

Senator BUMPERS. \$8.7 million I think it was.

Senator FORD. Was it \$8.7 million? They had two bids, one was \$2 million-plus, and the other was \$8 million-plus. And you cannot even sell it today because there is no enthusiasm and there is no Government leadership.

So I am looking forward to an energy policy, Henson. I wish we could get one. We sit here with States that spent millions and millions of dollars of their own money building labs, hauling coal from Wyoming and other places to see if it would not work. And then we had the private industry party that was willing to spend billions of dollars, Government would not share the override. Think about that.

This was a new plant, no one really had ever seen one built before, and Government would not give enough leadership to share the override with them. It was not built. 35,000 tons of coals per day, 105,000 barrels of oil per day. It is insignificant to the problems we have. And so I am just a frustrated Senator from Kentucky that has much of the reserve of coal in this country or in the world, and we sit there with a resource that nobody wants to help us with.

We jump up and down and raise all kinds of Cain when on August 1, oil goes from \$12 to \$15 a barrel to over \$30 a barrel in less than 30 days. Then we jump up and down and say the oil companies are gouging us. And you say it is a free market, let them do whatever they want. Have you ever heard of fair market? It is just very frustrating.

I am not going to ask you any questions, unless you have some answers for my tirade here. But, Mr. Secretary, I like you, and we are working hard on lots of things. And I am not sure that you have much control over what OMB tells you or what the Oval Office tells you. But I sure wish they would get off their duff and start coming up here and working with people who have been straining.

I drove an 18-wheeler in 1973. I shifted penitentiaries from oil to natural gas. We had emergency situations to keep 20,000 employees working at General Electric in Louisville. We had an emergency. They bought their own gas and forced pipelines to bring it. We had propane to substitute. Now the Secretary says you are going to have a propane shortage probably of 3 to 5 percent this year less than we had last year.

Let us have Government intervene in some of these things. Let us look at these oil companies. Let us see what they are doing about price gouging. And a windfall profits tax may be the next thing on the horizon. And it all goes one place. That gets us involved in our energy problem again. We talk about stripper wells. You cannot find a stripper well pumping today. Now at \$30 a barrel you will get them back up there.

I see heads shaking out there on your staff that we could get stripper wells back again at \$30 a barrel. At \$100 a day that is pretty good income. But I think that day is over when we would go back and open them up again.

So I thank you, Mr. Chairman, for letting me get it out of my system. But I guarantee you it is not the last.

Mr. MOORE. Senator, we have known you for a long time and worked with you and understand your frustration. We share it to a great extent. That is why we are building the national energy strategy. People are frustrated with us that it is not ready. When we started this thing a year and a half ago you were one of the few who saw the wisdom of doing this. Most people criticized it. Why are you doing this? Why are you wasting your time with it?

I think now the American people and some in Congress are beginning to realize that the work we have been doing for a year and a half was not so dumb after all. And we are being criticized now because it is not finished. Well, that is just the way the world works. You know, for anything you do you are going to be criticized.

The single largest R&D program we are working with is the Clean Coal Technology program. That is the biggest R&D program at \$2.5 billion, so we are not ignoring coal.

Senator FORD. Henson, let me stop you right there a minute. Your people testified before this committee that you only have one clean coal technology that would have the character that business and industry could accept that it would work. One by 1998. Now that is the testimony before this committee. I will go back and get it. It was done in the basketball gym, Dirksen 106.

And the rest of that testimony was that it would be 2001, 2002, or 2003 before five or six of those technologies would be on board. Now we are sitting here with the 1995 Clean Air deadline and a 2000 deadline. We are going to eliminate the possibility of having the technology we have put the taxpayers' dollars into. And so if we are not going to accelerate the research we ought to extend Clean Air deadlines to 1997, and then to 2003, so we can grasp these clean coal technologies that you say is the biggest research and development idea you have.

Now that was the testimony and I was there at the time your department gave it.

Mr. MOORE. Senator, we will check that.

[The information follows:]

There are a number of clean coal technologies that will be available in meeting year 2000 compliance targets. These largely fall in what is termed the retrofit category and include:

- Precombustion Technologies
 - Advanced Physical Cleaning
- Combustion Technologies
 - Advanced Combustors
 - Gas Reburning/Sorbent Injection
- Post Combustion
 - Duct Injection of Sorbents
 - Advanced Scrubbers

As to new clean coal technology power generation systems, or repowering technologies, only atmospheric fluidized bed combustion may be available by year 2000. Other repowering technologies such as those listed below will require the extension to year 2003 set forth in the proposed Clean Air Legislation for these advanced systems:

- Combustion Technologies
 - Pressurized Fluidized Bed Combustion
- Conversion Technologies
 - Integrated Gasification Combined Cycle

Mr. MOORE. I think what we are telling you is some of the most promising technologies require additional time and effort to develop them and to make them work to where they are commercially feasible. Now the difference I think in what you are saying and what you are seeing in the Bush administration perhaps is the fact that we do not see the value in throwing a lot of money in a subsidy to the problem. We do not think it will work.

We think what is going to happen is you are going to leave investors high and dry when the market does not accept what they are doing. The only way to make it work is to get it to where what you are trying to do will compete in the market on its own grounds. The proper place for the money from the Federal Government, and you have been giving us that money now for a number of years, is in the research to develop the technology. Then you put it into the marketplace and it can compete on its own grounds without a subsidy. That is where we have been trying to go.

We are confident the Clean Coal Technology Program will do that. We would be delighted if we could speed them up sooner than what we have on the books now, but it is hard to rush the technology and mock-ups.

Senator FORD. The point I am making is that if we are going to use the deadlines of 1995 and 2000 and lose the money, then you have to have them on board. You are giving them 3 years once they make the judgment, but if you only have one that is commercially feasible, then a lot of people are not going to be able to accept that.

Mr. MOORE. You realize that Congress, in its wisdom, advanced that by a year on us. It was not our idea. That was done by the Congress in the Clean Air bill.

Senator FORD. We are going to advance it some more before that is through, too, I tell you.

Mr. MOORE. Well, what I am worried about is that we can have those—

Senator FORD. Advance it or delay it I guess is what I am trying to say.

Mr. MOORE. Well, to delay it would be better.

Senator FORD. Right.

Mr. MOORE. Now you are talking. Because if you advance it ahead of the technology, you are left with a no-win situation.

Senator BUMPERS. Senator Bradley.

Senator BRADLEY. Thank you very much, Mr. Chairman.

Mr. Secretary, I was just curious. Do you wish you had a 1 billion-barrel strategic reserve today instead of 600 million?

Mr. MOORE. We see no need under the existing situation of oil from Iraq and Kuwait being lost to the world that we would need 1 billion barrels, no.

Senator BRADLEY. Would you feel more secure if you had 1 billion barrels in the stockpile?

Mr. MOORE. The studies we have done give us no rational reason for that. Certainly, I guess, we could say it is a good thing to do. The question is the money it is going to cost to do that. You have to weigh that.

The Administration decided it is not going to oppose the legislation now coming from the Congress with 1 billion barrels, and that

decision is one of, I think, political reality more than it is really a need for it.

Senator BRADLEY. So when did you change your position on that?

Mr. MOORE. I guess the Administration changed its position probably in the last week.

Senator BRADLEY. So that 1 billion barrels would give you more security, I guess?

Mr. MOORE. No, that is not the decision. The decision has to do with the fact that the Administration has bigger things to fight now than this. Due to the Iraqi situation it is something that the Congress feels strongly about. Why fight any further?

The analysis has not changed. The analysis that we gave the Congress which we spent 1 year doing indicates there is no real basis for it. If we were to cover the entire shortfall left after the increase in worldwide production, there is enough in the Strategic Petroleum Reserve to take you for 580 days, well beyond any interruption anybody has ever seen historically even if we did it all by ourselves with no help from the other countries and their reserves.

Senator BRADLEY. But this is a change in policy in the administration. You strongly opposed a 1-billion-barrel Strategic Petroleum Reserve against the efforts of many people on the committee, and now you have changed your position and do not oppose the billion barrels.

Mr. MOORE. That is correct.

Senator BRADLEY. That is correct.

I welcome that change. I think that if it had occurred earlier we obviously could have been further along.

Now let me ask you, the Secretary today said that he was prepared to use the reserve in the fourth quarter. Under what circumstances did he say he would use the reserve in the fourth quarter?

Mr. MOORE. The Secretary does not have the authority to use it. As you well know, Senator, the President himself has to make this decision.

The Admiral was stating the fact that if we are going to have any kind of supply disruption from what we now see, it will occur in the fourth quarter. As the bubble of those months of lost production from Iraq and Kuwait moves through the pipeline, it will hit here about mid-September before it is made up for by increased production by Saudi Arabia and the United Arab Emirates and other countries. That is the standpipe chart we are showing you here.

That would be the time period that we will really watch extremely closely to advise the President to make a decision whether or not, according to the statute, a severe energy supply interruption is going to occur. If it is, then the President would make that decision, and within 16 days the oil could be pumped from the reserve.

Senator BRADLEY. So you are saying imminently?

Mr. MOORE. We are watching it every day.

Senator BRADLEY. September is this month; is that correct?

Mr. MOORE. Correct.

Senator BRADLEY. Where you will have the big loss?

Mr. MOORE. Correct.

Senator BRADLEY. If what the Secretary said today carries through, we should expect that if that loss of, as you say, up to 3.5

million barrels hits the market, where do you think price is going to go?

Mr. MOORE. Now that is the world market, not the U.S. market we are talking about. That is the world market.

Senator BRADLEY. Where would price hit?

Mr. MOORE. The trick is twofold. One, regarding the 4.3 million barrels per day that Iraq and Kuwait were producing some of that was not going into consumption. Some was going to stockpile building. The world has the largest stockpiles we have seen in a long, long time, so we are not sure just how much of that is going to have to be put into the market to replace that which is gone.

Secondly, people are drawing down their private stocks. That may continue. We would prefer that to happen before we start using the Government-owned stocks. That has been occurring, and we think it will continue.

Senator BRADLEY. How much is it drawing down?

Mr. MOORE. We can give you the figure of how much the private stocks have been drawn down worldwide, and we will get it to you.

[The information follows:]

At the end of the second quarter 1990, commercial petroleum stocks in the world market economies stood at a relatively high 4.7 billion barrels, about 430 million barrels above the 1987 to 1989 average. In the United States, commercial stocks of crude oil and petroleum products were almost 1.1 billion barrels at the end of the second quarter, some 60 million barrels above the same time last year. In the U.S. most of this increase was in crude oil inventories.

Worldwide and U.S. stocks are typically built in the third quarter in preparation for the heavy demand during the winter heating season. For example, the third quarter increase in U.S. stocks averaged 47 million barrels over the four years 1986 through 1989. Prices, demand, weather and other factors can influence the size of the stock build as indicated by the range in stock increases over this same four year period (12 to 71 million barrels). During the third quarter of 1990 through September 21, U.S. commercial stocks have increased about 30 million barrels, somewhat below the recent average. U.S. stocks still remain some 50 million barrels above the same time last year.

It is anticipated that these high stock levels will be used to offset losses in supply in the near term. Due to the four to six week transit time from many producing countries, very little of the loss in supply has reached the consuming nations, so significant use of stocks has not yet been necessary. However, during the period from September 7 through September 21, there was a decline in U.S. crude oil imports, and the industry drew down crude oil stocks of over 11 million barrels to maintain high refinery runs. These high production levels were used to replenish gasoline inventories which had been low and to continue to build distillate stocks for the coming winter.

Third quarter stock data outside the U.S. is not yet available, but they will be published in the Energy Information Administration's daily Energy Situation Analysis Report at a later date.

Mr. MOORE. The third point is, we would much prefer to see a coordinated drawdown with our allies in the IEA. We do not want them to ride our coattails. If we start automatically drawing down our SPR, then they will get the benefit of what that does to the world supply and price without using their SPR's.

Senator BRADLEY. When will the IEA meet?

Mr. MOORE. On September 26 or 29 it has another meeting of the Board of Governors.

Senator BRADLEY. So that if this translates through to price, we might very well have much higher prices prior to September 29, if you lose that 300 million barrels prior to the meeting of the IEA?

Mr. MOORE. If it is not made up by drawdown in private stocks. If you have some kind of aberration and consumption which you do not expect, then what you say could happen. You could have a price spike.

Senator BRADLEY. So you are saying that the President will not act until the IEA acts?

Mr. MOORE. No. I am saying that is what the President prefers. The President obviously under legislation has the authority to act unilaterally.

Senator BRADLEY. That could dampen price increases; is that correct?

Mr. MOORE. The models indicate that, depending upon the size of the drawdown, it could have an effect on prices, yes.

Senator BRADLEY. You know, as one of the people who pushed hard to get 600 million barrels in stockpile, it is there precisely to use to counter the economic consequences of a disruption. The economic consequences of a disruption when you are dancing on the edge of a recession may dampen the potential increase in price.

So I would urge you and the President to realize that he has a tool that can and should be used.

Mr. MOORE. Senator, your point has certainly been well heard. You made those points in the August recess, and we noted them then. I think the difference is that what we are looking for, as the statute intended, is that we really have a supply disruption; that we really have the potential, as the statute clearly says, of a major adverse impact on the Nation's economy.

If we are talking about a 7 cents-per-gallon increase in gasoline, I understand in the budget summit you are talking about doing that to raise money to bring down the deficit anyway.

Senator BRADLEY. The only difference is we have that money instead of OPEC.

Mr. MOORE. No, the only difference is that this is not to be used to take care of temporary price fluctuations unless you change the law. It is to be used, as the statute says, for major adverse impacts on the economy, major supply disruptions.

Senator BRADLEY. How will you know at the end of September if that price spike that you expect is temporary?

Mr. MOORE. From the figures that we are collecting daily and giving to the White House daily or as often as they ask for it. We are monitoring every day what is happening in the world oil market in terms of supply and demand. Based upon a shortage hitting this country, we tell the President; the President makes his decision whether he thinks it is severe enough to trigger using the SPR.

Senator BRADLEY. Let me just reiterate. I know there are a lot of American consumers out there who are increasingly going to be angered by higher prices. You have a tool at your disposal that could reduce those price increases, and I urge you to use it or at least state your willingness to use it. Even that, I think, would have an impact on the market.

Mr. MOORE. The President has said and will continue to say that he is willing to use the Strategic Petroleum Reserve within the intent of the statute. If we are talking about whether we should use the SPR for a 10 cent-per-gallon increase, that is not what it

was created for, Senator, and I do not think that is what the President will do.

Senator BRADLEY. Well, we have a little disagreement; not a serious disagreement but a little disagreement there. Let me ask you another question.

Are you confident that you can get oil out of the reserve and into the market in a timely fashion?

Mr. MOORE. Yes. On paper, the paper drills and that sort of thing we have done say that we can do it. The mechanics who operate it say they can do it. Senator, as you well know, there is nothing in the law on, nor have we ever had, a major test to see if everything will function as it is designed to do.

Senator BRADLEY. Would you describe the 1985 test?

Mr. MOORE. A very small test, something like 3 hours worth of pumping oil, 1 million barrels.

Senator BRADLEY. You pumped 1 million barrels out of the reserve to where, the loading on the Mississippi or into the pipeline?

Mr. MOORE. It went to a tanker.

Senator BRADLEY. So it went to the loading on the Mississippi?

Mr. MOORE. Yes.

Senator BRADLEY. So you pumped 1 million barrels out in 3 months?

Mr. MOORE. No, 3 hours, something like a half day. That is not really a significant test.

Senator BRADLEY. Okay. When you say that, what would be a significant test?

Mr. MOORE. We think a significant test would be something along the lines of probably 1 month, to where you are pumping as the system can take the oil in the pipelines or as tankers arrive, over a period of 30 days, for a substantial amount of oil, maybe several hundred thousand barrels per day.

Senator BRADLEY. In 1985, under what authority did you test it?

Mr. MOORE. Specific legislation passed by the Congress for a one-time small test. The statute does not give us authority to do it otherwise.

Senator BRADLEY. You thought it gave you the feeling of security that you could do it?

Mr. MOORE. I thought the test was a good idea. I was not in the Department then, and I do not know whether we supported or opposed that. It turns out, looking back, it really was not a real test of the system.

Senator BRADLEY. Would you like to have legislation urging you to run a test of 300,000 to 400,000 barrels?

Mr. MOORE. We do not have Administration clearance to ask for that. We realize that is in the same legislation we are talking about; the Administration has no opposition to it. We in the Department of Energy think it is probably a good idea to have that kind of authority.

Senator BRADLEY. So that if we pass the overall SPR legislation, included in that would be the authority for you to do these tests?

Mr. MOORE. We understand that is in the legislation, yes.

Senator BRADLEY. You would urge us to pass that, including the 1 billion barrels that you oppose?

Mr. MOORE. The opinion of the Administration is it has no opposition to that.

Senator, I have been given a figure for which you asked me a moment ago. We do have the figure here this morning about the drawdown in private stocks in the United States. We will get it for you worldwide.

In the United States on July 27 prior to the invasion, there were 92 million barrels per day above the minimum operating level. Today it is 76 million barrels. So there has been a drawdown there from 92 million to 76 million barrels.

Senator BRADLEY. I only have one more question, and it is kind of a threshold question, because as Senator Ford said, some of us who sat in this room in 1979 and went through this disruption scenario, we produced, I thought, a rather comprehensive analysis and report on what should be done.

One of the major recommendations was the development of a Strategic Petroleum Reserve. I believe that that reserve has been developed only because of this committee. We have it, but now we are back in the disruption mode.

My question is, if we imported half the oil that we now import because miraculously we were able to reduce it through a variety of methods, and there was a disruption, and the price went to \$40 a barrel, what would be the price for Texas Intermediate?

Mr. MOORE. I cannot answer that. I assume very similar.

Mr. KENT. Texas Intermediate usually sells for about \$3 above world price.

Senator BRADLEY. So in other words—

Senator BUMPERS. Senator Bradley, if I may interrupt you just a moment, I want to get that on the record. The answer came back here.

Mr. MOORE. That was Cal Kent, who is the Administrator of the Energy Information Administration, and his answer was—

Mr. KENT. Texas Intermediate usually sells for approximately \$3 above the world market price.

Senator BRADLEY. So if the world price went to \$40, Texas Intermediate would be at \$43?

Mr. KENT. That would be a fairly safe prediction.

Senator BRADLEY. So the cost to the United States, even if we cut in half our imports, would be significant and serious, if there was a disruption, correct?

Mr. MOORE. Yes.

Senator BRADLEY. So what you have to do is, you have to understand that even if we imported no oil and there was a disruption, what would be the price of Texas Intermediate? The same as the world price. So unless you are prepared to put on all kinds of controls—which I take it you are not, is that correct?

Mr. MOORE. That is correct.

Senator BRADLEY. The world price of oil, even if we imported no oil, would determine the price of oil to the American consumer, and so it is an illusion to believe you can keep us protected from world market fluctuations, correct?

Mr. MOORE. I am not sure I am ready to draw that conclusion.

Senator BRADLEY. Well, is it correct?

Mr. MOORE. Senator, the point you made earlier, if you were to make a substantial drawdown in the SPR it would affect the world price of oil.

Senator BRADLEY. I am off SPRO now. My point is that before we get into very expensive alternatives, we have to weigh what those alternatives are supposed to do, and our economy remains vulnerable even if we imported no oil, and that is something that we have been through a couple of times in the committee, and I just hope we do not make the same mistakes we did in the early 1980's because we did not understand that.

Thank you.

Senator BUMPERS. Senator Bradley, thank you. Would staff remove those charts there, please? They are distracting, and the people back in the back cannot see, and it is maddening to try to follow a hearing when you cannot see anybody.

Senator Wallop—just before you go, one other thing I would like to get on the record, we were just discussing it here informally, Mr. Secretary, the Federal excise tax on gasoline is 9 cents a gallon, and I think most people know this, but just for the record the ethanol exemption for gasoline, if it contains—if gasoline contains 10 percent ethanol, the tax exemption is 6 cents of that 9 cents, is that correct? A 6-cent tax break on ethanol—gasoline with ethanol?

Mr. MOORE. Yes.

Senator BUMPERS. Senator Wallop.

Senator WALLOP. Thank you, Mr. Chairman.

Mr. Moore, thank you for your presence here, and there are so many things, as has already been pointed out, that we have heard before.

One of the things that I hear that I heard before is that Americans have almost a theological right to cheap energy. It is more than constitutional. I would say to my friend from New Jersey, our economy remains vulnerable because it is so heavily dependent upon energy, and at least to date, and for as long as this crisis is going to last, oil is the sort of gold standard of the BTU business. It is that price upon which other BTU's play off.

While Congress, and this committee in particular, was heavily instrumental in the creation of SPRO, I would think it is fair to say also that Congress is absolutely not without blame in the lack of an energy policy.

I recall in 1987 holding a hearing in the Finance Committee on the possibility of an oil import fee in which New England and the rust belt went into a state of total panic in that there might actually be a stabilization, a floor on the price of oil. Had there been, we would not have had such a serious draw-down in U.S. production capabilities. But that is over the hill.

Well, I am here to point out that it was Congress which stopped us from stabilizing the price of oil, and which basically was responsible for the collapse of the independent industry and the major collapses in U.S. production.

A Congress which, without hearings and without bills, was often the one to pass moratoria on off-shore drilling; a Congress which has now passed a Clean Air—or, is about to pass a Clean Air Act

with a permitting section that is going to make it virtually impossible for us to advance new energy technology—6 years to permit it.

When you are trying to be on the cutting edge of technology, you also have a requirement in there for permits for modifications, and how you are going to modify a cutting edge technology plant when it is going to take you 3 to 6 years for each modification is a little, yet, beyond me.

I think this Government, the Bush administration, is trying for an energy policy, but I think this Government is almost congenitally incapable of drawing one. There are seven offices in the Office of the President that have some direct say in energy policy. There are 10 Cabinet officers that have some say in energy policy. There are some—what is the figure?—I think it is 44 committees and subcommittees of both Houses of Congress that have some direct say in energy policy, all of whom are more jealous of their turf than the Nation's.

We have all watched it, and I suspect when this crisis is over we will return to the theological right of Americans to cheap energy. I would like to see it different, but I doubt that we will.

I am also struck by the similarity of the conversations in this committee and around the Congress with those in 1979. I think the Senator from Oklahoma pointed out that while everybody was talking then about the outrageous profits of oil companies nobody paid heed to the collapse in profits and to the collapse of the independent side of the industry.

I would also point out that the guy on the corner who has a 5,000 gallon tank of unleaded fuel is not able to sell that at a profit directed from the price that he paid for it but the price at which he is going to have to replace it. Where is he going to get the capital to buy a 5,000 gallon tank of fuel if he sold the previous one at less than the cost of getting some more fuel into that tank?

So there is a certain reality to just ordinary business, and it is supply and demand, and I would question one thing that you said, Mr. Secretary. You said that you hoped this would settle down to a more reasonable figure—the price of oil, spot market, futures markets and others—but I am here to suggest to you and to the American people that we have not seen the end of this crisis because it is in a temporary flat point.

People are worried about what happens. You heard the man yesterday who escaped from Kuwait, or was allowed to leave from Kuwait, who said that they have wired all the Christmas trees, all the production facilities, for explosives.

Anything that was done there, anything that might be done to disrupt Saudi supply, even though temporary, is going to have a major effect on that 12.7-million barrel shortfall over the next 8 months, and so people whose livelihood it is and whose business it is are not going to feel as comfortable as we are in here in declaring an end to the emergency and in a search for stability in prices, and I do not believe we are going to see much stability.

You saw the blip that took place yesterday, when Ali Khameni called for a Jihad against the West. Not that he was willing to be an ally of Iraq, but that he was still the greater enemy of the West.

These are the kinds of things that are going to make people whose livelihood it is very nervous, and you are going to see reac-

tions, and there is not necessarily price gouging, but people sort of protecting their interest.

I think by and large the smaller traders get out of—the sort of day traders and week traders get out of the commodities markets when the level of instability is such as it is right now.

Mr. Moore, let me ask you just a couple of quick questions.

The incentives for domestic oil and gas exploration I think are welcome. Some of us have been trying to do that. Some of us thought that we were ill-advised to take them out of the 1986 Tax Act, but given what has happened in the domestic oil market, my guess is that that is not going to trigger a lot of private investment.

The fear is that we are going to go back some time, if this should be resolved at any time in the near future, to \$15 oil when people have based their investments on \$25 oil and you are going to find very little in the way of energetic investment except by the real professionals in the business. Banks are not going to be particularly willing.

Is there anything the administration is looking at in trying to provide some floor below which these prices would not go, so that that can give confidence to investors and particularly lenders of money for the production of oil and gas?

Mr. MOORE. Senator, as we sit here this morning I am aware of no provision being considered by the Administration to be submitted to the Congress for legislation on that subject. These things are properly matters of discussion for the national energy strategy, and you will be making a decision on those things when that strategy comes to the Congress. If you feel that is a proper measure to be included whether the President has recommended it or not, that is the time to do it.

Senator WALLOP. Henson, I go back to the number of cabinets and committees and subcommittees that had some say. We will not be able to do those things because of relative values of turf within the Congress unless there is a direct, straight, vigorous involvement on the part of the President of the United States, not the Secretary of Energy or the Department of Energy.

He is going to have to lay down a series of hard and fast recommendations. The Congress will contest them. Maybe others in the cabinet may contest them before he gets them out, but after they come out unless the administration is more or less uniformly behind them, all 10 cabinet offices that have a say, all 7 offices in the Office of the President, you are not going to be able to get the committees and subcommittees of Congress to function.

So it is just a recommendation to realize the physical structure of the United States Government as it is composed in the executive and legislative branches and to try to figure a way to get us beyond where we have always gotten, which is essentially nowhere.

Mr. MOORE. Senator, that has been the whole drill. People are criticizing us for moving so slowly on this policy, and you have laid out in your statement this morning a very true representation of what this Government faces. If we could have had an energy strategy that everybody could agree on, you would have had it years ago. This is going to be a difficult process. It is just as difficult within the Administration as it is going to be when it is finished and then given to Congress to try to enact.

The one thing we have going for us which we may not have had in the past is the fact that we have a President who knows more about energy than any President in history. He is not intimidated or scared to act. So I assure you that when he goes over the strategy and determines his position and delivers that to the Congress, you know where he is and he will go to the wall to see to it that it becomes law.

Now the Congress will obviously want to modify it, add things to it, take things away; that is the whole process of building a strategy. At least he has thrown the ball in the court by having us develop the strategy. He will decide what his strategy will be based on the work we are doing, and the Congress and the American people will go from there.

So I think there is little difference here in the bleak picture and the accurate picture you presented of the past. Since we have a President who will lead, it is not going to be a sterile report, I do not believe. What we have seen before is well, this is what the National Council of Legislators from Oil Producing States agree on, or this is what the National Consortium of Environmentalists agree on. It is going to be what everybody says about it, every possible option, what it will do, and what the President selects of those.

So the point is it is not going to be something that, well, you disagree with what he did, he did not think about more solar, for instance, or he did not think about more of this or that. It will be there.

Senator WALLOP. I guess my plea is that he does select and that it come presented to us much in the way tax reform was; that this is our goal and our purpose and, therefore, and then it goes through the process. But at least there will be something from which to add and detract and not just to discuss.

Mr. MOORE. I think you will be pleased, Senator. That is what we envision. That is what we believe the President envisions.

Senator WIRTH [presiding]. Senator Akaka, I think, is up.

Senator WALLOP. I did not realize until this moment that we had been operating on a time frame.

Senator WIRTH. Everybody has been doing about a 10-minute period of time, and you have been going for about 16.

Senator WALLOP. Very curious. Thank you.

Senator WIRTH. Thank you, Senator.

Senator Akaka.

Senator AKAKA. As a former colleague in the House, welcome to the committee. I may be the newest member of this committee, but concern about America's energy is not new to me. Throughout my 14 years in the House of Representative I fought an often lonely battle to halt the Federal Government's dwindling commitment to renewable energy. During the decade of the 1980's, the Reagan-Bush administration pushed for deep cuts in renewable energy research.

The fiscal year 1990 budget for solar and renewable energy is less than 20 percent of the 1980 level and represents only 10 percent of our commitment of a decade ago. We are now paying the price for years of neglecting our renewable energy needs.

Mr. Secretary, the islands of Hawaii are rich in many things, especially beauty, but poor in fossil fuels. We rely on oil for 90 per-

cent of our energy needs. All of it arrives by ocean tanker. Hawaii is the most oil-dependent State in our Nation. We are more dependent on oil than Japan. Oil supply disruptions are our greatest nightmare. If the Middle East sneezes, the mainland may catch a cold but Hawaii comes down with double pneumonia in a case like this. That is why we need our emergency petroleum reserve.

Last January I testified at the hearing chaired by Secretary Watkins in Honolulu of the energy strategy. As I stated then and will repeat now, when you write your national energy strategy the chapter on Hawaii must include a regional petroleum reserve for Hawaii. The United States has 590 million barrels in reserve. If imports were severed, the rest of the country would be relatively safe from economic harm. Hawaii will not be so fortunate.

Our only means of access to the SPR would be by tanker deliveries from Gulf ports through the Panama Canal. Studies have determined that the minimum delivery time for SPR to Hawaii is 53 days. This exceeds Hawaii's average inventory by 23 days. Under these circumstances, our supply of oil would dry up, and our economy would come to a standstill.

Mr. Secretary, I have made the point that renewable research has been cut, cut to shreds. Because of this, Hawaii has been denied access to the only means of reducing its dependence on oil. Having denied Hawaii the opportunity to achieve the energy independence it needs, your department then tells us that we cannot have an emergency petroleum reserve.

Hawaii tax dollars help fill and maintain the SPR, but Hawaii does not benefit from the energy security the reserve provides. That is not fair, and it is not right. Mr. Secretary, you need to re-examine this question.

I have before me the latest analysis prepared for the State of Hawaii on Hawaii's energy supply situation. The report contains revised projections which reflect your department's latest oil supply forecasts and the experience gained from Iraq's invasion of Kuwait. The report finds that Hawaii's dependence upon oil imports will grow at a much faster rate than previously anticipated, and there are grave uncertainties about the Federal Government's ability to assure that SPR oil can be delivered to Hawaii before our supply runs dry.

These findings are not very reassuring, Mr. Moore. I hope this report will cause you to examine your department's opposition to an emergency reserve for Hawaii.

I have two questions, Mr. Moore. As I said, Hawaii is 90 percent dependent on oil. In the event of a severe cutoff of oil, the minimum delivery time for Strategic Petroleum Reserve to Hawaii exceeds our average inventory by 23 days. Under these circumstances, do you believe that a regional petroleum reserve for Hawaii makes sense?

Mr. MOORE. Senator, when you and the Governor and Congresswoman Pat Saiki all testified back in January, we listened to you and have thought about this very carefully. The Administration has decided not to oppose the conference report on the Strategic Petroleum Reserve which has a provision in there to allow us to test, in a pilot program, as we understand the language, such a re-

serve as you envision. I think a product reserve is what it speaks to. The administration has decided not to oppose it.

We have concerns about it, but we have decided not to oppose it, and so we will make our best effort to make it work and to test something such as you have in mind.

Senator AKAKA. As I have reported here, it takes 53 days for oil to be delivered from Louisiana through the Panama Canal to Hawaii, and that would certainly disrupt and be harmful economically to Hawaii. There has never been a test drawdown of the SPR that I know, and certainly no oil from the central reserve has ever reached Hawaii.

Your assessment of how Hawaii would be served in the event of an SPR drawdown is based on analysis and projections. These theoretical models are not reassuring to us. In Hawaii, we do not believe that theoretical methods will put gas in the tanks of our automobiles.

My question to you, Mr. Secretary, is in the event of a drawdown what assurances can you give Hawaii that oil will reach us before we run dry?

Mr. MOORE. Senator, the way the situation works is that we sell the oil in the market to the highest bidders. And when they can get it, first of all, assuming there is a bidder from Hawaii, and how soon they can get the oil there is a matter of that bidder and the transportation plans that they make and transportation arrangements that they make. And so we really cannot answer your question.

I guess under the best scenario, assuming that there is somebody from Hawaii bidding, and we can load it within the 16-day time period we project, the answer I am getting from our people that run the reserve is that it would take 24 to 26 days from the time we load the tanker at the Strategic Petroleum Reserve to get the tanker to Hawaii.

Senator AKAKA. I think you know, Mr. Secretary, that there is another factor here to consider, and that is tankers, that we do not have as many American bottom tankers as we need, and we would have to rely on foreign tankers and that is a factor that should be considered. The 53-day estimate is in the energy report that I have here for you. Your estimate takes into account all facts, including availability of ships, and I have just mentioned that is a factor that we need to consider.

I want to point out that the study I have presented to you casts grave doubt in my mind about your conclusions and assurances, and I hope, as I ask, that you consider our concerns.

Mr. MOORE. Senator, we certainly will. As I said, if this legislation is passed in its conference report form by both Houses of the Congress, if the President signs it, there is the authority in this legislation to begin to address in a pilot program what you are talking about.

Senator AKAKA. Thank you very much, Mr. Secretary.

Senator WIRTH. Secretary Moore, you are about to face questions from Senator McClure, and then Senator Wirth, and then Senator Rockefeller, a veritable phalanx coming at you and I thought perhaps you would like to take a quick stretch.

Mr. MOORE. Senator, I would appreciate that.

Senator WIRTH. Why do we not take a stretch for about 7 minutes and then come back to the distinguished senior Senator from Idaho.

Mr. MOORE. Thank you, Senator.

[Recess.]

Senator WIRTH. The committee will come to order. Senator McClure.

Senator McCLURE. Thank you very much, Mr. Chairman. At the end of a long morning with the number of questions that you have had and the number of comments that have been made already, I am very puzzled to know what I can add at this stage.

When Senator Bumpers was here I was going to comment that some great American said, and perhaps it was Senator Bumpers, this is *deja vu* all over again. It was not really Senator Bumpers. I knew who did it, but really, for those of us who have been around here a few years, it is really another chapter in an ongoing saga with the same dialogue today that I have heard at least twice before. Some of the comments that have been made deserve some answer.

For example, there are today four operating synfuels plants that would not be operating today if we had not had the Synthetic Fuels Corporation, and they are applying and demonstrating technology which the taxpayers of this country paid for. Some say too dearly, and others today are saying not too dearly at all, it was a good expenditure of money. The Great Plains coal gasification plant in North Dakota, the Cool Water plant in Daggett, California which is a combined-cycle, low-BTU power plant, the Dow Chemical coal gasification in Baton Rouge, Louisiana, and I might add to that list of coal-using plants the Union Oil Shale plant in Rifle, Colorado.

Now, some people say that is a very short list for the very large expenditure we made in the Synthetic Fuels Corporation, but I mention it because I was opposed to the dissolution of the Synthetic Fuels Corporation, and I thought then and I think now that it made contributions and could have made more. And some will say the only fault with it was it was mismanaged and others did not like the idea at all. Would we be more exposed today if we had not done what we did then? I mention it now because we may have to do some more.

Yes, Senator Bradley mentioned the SPR and certainly he has been a leader in fighting for larger strategic petroleum reserves, and I have shared in that battle over the years. We have consistently found the administration is opposed to the SPRO and then taking credit for it after we use it. I will disagree with Senator Bradley on one point. This is not, in my judgment, the time to use SPRO. As a matter of fact all you have to do is read the statute. Read the law that is on the books today and it specifically outlines the conditions that must exist before there be a drawdown of SPRO. And we do not meet those conditions today, and I would be very, very much opposed, strenuously opposed. It would be a terrible mistake for us to attempt to use a strategic reserve, whether it is oil or any of the other strategic reserves we have in order to affect market price.

Market consequences, economic consequences, yes. That has to do with the availability, not the pricing, of a commodity. And I have

seen over the years of my service here in the Congress and the years before that too, people trying to use strategic reserves to achieve economic objectives, and it is an awful mistake. It has never worked and it should not be indulged in now. And I hope if we are going to look at history, we will look at least at that part of history and commend those who helped in the creation of the statute under which the oil reserve is held so that we do not fall back into that terrible trap of seeking some short-term political advantage and appealing to consumers because of price runup. It would be an awful mistake to divert that purpose.

Mr. Secretary, I have one area in which I am very uncertain today. We do have a price spike in the marketplace today. We do not yet have a product shortage. Now, there are two things that have happened that are somewhat different this time than they were in 1979 or 1973 and 1974. One is that we had large stocks on hand. Not because of governmental action so much in this country, but because the market was favorable, prices were low, people bought ahead. For whatever reasons, there was more product, more crude oil, more refined products in pipelines and in stocks than is normal. Inventories were high, and therefore, people had to fear less.

We also have the Strategic Petroleum Reserve and 590 million barrels of oil in the reserve, so people fear shortages less. But something else has happened, however, and that is we now have a commodity futures trading market, and I am speculating now because I am not smart enough to know. In past interruptions there was immediate bidding for supply. People went out and tried to tie up commodity because they were not sure they would have it or because they thought they would profit by it.

This time the speculators do not have to do that. Those who are just shopping for immediate profit can bid in the futures market, and I am wondering if there is any evidence that supports the thesis that instead of bidding supplies they simply bid for contracts. They speculate in contracts instead of in oil.

Mr. MOORE. Senator, we would agree with that.

Senator McCLURE. Now that means that all those speculative forces come into the market, the speculators are looking for quick profits, come into the market, they now affect price and consumers pay the price. But they do not buy product; therefore, the supply is interfered with less. Even though the price fluctuates, the availability of supply does not. I am not sure that that is correct, but I think it is at least worth looking at to see if that is a price that the American public pays for an insurance policy with respect to availability of supply.

I am sorry that the consumers have to pay that price as speculators seek profits and then seek to shift the risks and succeed in doing that by putting the cost of their speculation on the shoulder of American consumers. But again, it would be a terrible mistake for us to get back into what we did once before, and that is either the Government trying to control the price, or secondly, to allocate the supply.

Two things happen the minute the Government gets involved. The supply gets much more constrained because the Government, in attempting to allocate, withholds from the market. And what-

ever it is, maybe only 10 percent, if you have got a 2-percent shortage and the Government gets involved and withholds 10 percent, that 2-percent shortage became 12 percent overnight, just by the simple intervention of Government necessarily withholding stocks, trying to decide where they should put them.

And the second thing that happens is the very moment that there is a perception of a supply disruption, price goes up and so does apparent demand. I do not mean to beat up on people. I have beaten up on them in the past, but I will use a name because I remember it. In one of the previous supply shortages, John Denver brought \$5,000 or 5,000 gallons of gasoline to put in his gas tank at his mountain home west of Denver to make sure he would have enough gas to run his sports car.

Now, I do not pick on John Denver. He was doing just exactly what Americans do all across the board. If they have got the money and they can avoid any disruption or inconvenience to themselves, they pay the price and somebody else has the disruption and the inconvenience. But apparent demand escalates the minute there is an apparent shortage.

So if we have the actions that we have taken in the past, do anything to assure the American public that there will be adequate supplies, then indeed they do not have to try to corner their share by increasing apparent demand and therefore increasing apparent shortages.

One final note, Mr. Secretary. Senator Akaka and others from Hawaii—Pat Saiki, the Governor—as you noted in your comments, have all testified that they want assurances of supply for Hawaii, and I understand that.

The best assurance that they have is to have product storage and not crude oil storage, and yet product storage is the most costly, most inefficient way of running a strategic reserve, is that not correct?

Mr. MOORE. Yes.

Senator McCLURE. A great many people have the belief that if you want gasoline in the future, all you have to do is put gasoline in a tank or in the ground today and you will have it in the future. Gasoline is not a stable chemical compound, is that not correct?

Mr. MOORE. Correct.

Senator McCLURE. As a matter of fact, it changes over time. What you pump out of the ground is not necessarily what you put in the ground, and because of that the storage of gasoline commodity over long periods of time is very inefficient both in economics and in terms of supply of product, is that not correct?

Mr. MOORE. Yes.

Senator McCLURE. So we ought to be very careful about strategic product reserve. Is that not one of the things you have on your mind as you are looking at the possibility of a test of strategic reserves?

Mr. MOORE. Yes, we certainly are, and we are very nervous about the language that is in the conference report that will be presented to the House and Senate—maybe it already has been—today or tomorrow. We are very concerned about that for all the reasons you just indicated, that hopefully the language has been drawn tightly enough that it can be managed as a pilot program, and if every-

thing you say is true, that will be proven and the Congress will understand that and that will be the end of that experiment, but we will have to wait and see.

Senator McCLURE. That conference report was agreed to and the conferees signed off on it yesterday. It has left the House this morning and should be in the Senate this afternoon, so I am helpful that at least the legislative framework for the actions will be approved and in your hands by the end of today.

Mr. Chairman, I want to conclude only by saying thank you to my friend from Kentucky for the kind words that he had for me a few moments ago with respect to energy policy.

I am not going to try to repeat what I have said over the last 15 or 20 years, but I remember in 1970 asking the Republican Conference in the House of Representatives to create a task force on energy. They did. I was named as its chairman, and so for 20 years I have been looking at precisely the same kinds of situations and arguments that we hear here today.

I wish someone would listen with respect to long-term strategy and policy. We have a lot of shut-in capacity in this country. We have a number of refineries that are in mothballs today, closed down by environmental constraints, is that not correct?

Mr. MOORE. Yes, Senator.

Senator McCLURE. I do not suppose there is any prospect in the world that even in the event of an emergency those refineries would be permitted, or could be induced to operate to provide product?

Mr. MOORE. I do not think so, Senator.

Senator McCLURE. If they are not permitted to operate, there is no way for us to process all of the crude oil to provide for us all of the product that we want, is that not correct?

Mr. MOORE. Senator, we are far more concerned about the possible shortage of certain refined products than we are crude oil. You can pump the crude oil, and that does not get you anything, that is exactly right.

Senator McCLURE. So if you have a draw-down of SPRO but you do not have any place to refine it, you have only run up cost and you have gone through a foolish exercise.

Mr. MOORE. Exactly.

Senator McCLURE. Now, one of the things that nobody has focused on is that a large part—no, a significant part of what the world was getting from Kuwait was refined product.

Mr. MOORE. That is correct.

Senator McCLURE. Those refineries are still in Kuwait, and you cannot run somebody else's crude through it and get refined product into the market today.

Somebody has to understand that there is a relationship between facilities and product and availability to consumers. A few years ago the Saudi Government bought an interest in Texaco refineries, and they were concerned about U.S. reaction.

I told them and I told the public the best thing that we can have is to have Saudi investment in American production facilities, and I am grateful today that they did that, and we benefit today because they did that a few years ago. They were looking forward. I wish we could do as well as they did in seeing the advantage to us

of having their investment in refining capacity in the United States. If the Kuwaitis had done the same thing, we would have Kuwaiti investment in refineries operating in the United States today, and this situation in the Gulf would not be as crucial to the consumers of this country.

Those are just examples, little examples, of concerns that I have about U.S. Government energy policy, and many critics say, oh, we need an energy policy that is going to solve this problem. I hope they recognize that there is not any magic solution. I hope they realize there is no single action, and I hope we, in an energy strategy, begin to dovetail a number of policies of Government.

Take, for example, ethanol. Yes, ethanol cannot compete with \$18-dollar-a-barrel oil and the gasoline that comes from \$18-dollar-a-barrel oil, but we spend \$20 billion or more in agricultural subsidies in this country, and if we took some of that agricultural subsidy and put it into ethanol to create a market for 60 million acres of production in this country, we would not have to put it into an agricultural program.

If we would look not at the \$1.60 or \$2.00 a gallon that ethanol might cost, also at the octane-enhancing value of an alcohol additive to gasoline fuels, and look at the economic benefits of octane enhancement in fuel efficiency and environmental efficiency, then we would see that, indeed, an expenditure to guarantee the availability of ethanol in fuels is not a cost simply in fuel terms, it is a benefit in other terms as well, and justifies both cost and investment.

I understand Senator Ford's frustration at seeing an Ashland Oil ethanol plant close at a time when Government could very easily have taken steps to see that Ashland Oil continued to operate that ethanol production facility.

I visited the plant at the time when it was running. It ought to be running today. Our agricultural product, our agricultural programs, as well as our energy programs, would benefit. But there is some cross fertilization. We tend to segment our judgments. We tend to get tunnel vision when we look at problems, and we tend not to look at the broad range of opportunities that we have.

Mr. Chairman, thank you for your time. I do not mean to harangue this committee or the Secretary either. We have been talking for years. It will take months, not minutes, to find answers to some of these problems.

Mr. MOORE. Senator, the only thing wrong with your statement is the fact that you will not be here next year, when the National Energy Strategy is received, to finally begin to work your long years of experience into fashioning something that will work, and we will miss that.

Senator McCLURE. Well, I may even write you a letter.

[Laughter.]

Senator WIRTH. Thank you very much, Senator McClure, and I would just echo what Secretary Moore has just said. We will miss your harangues, because they are right on the button when it comes to talking about energy, and your wisdom and perspective have been of highly valued by all of us.

I feel as though I have been through this as well. I had my first meeting as a freshman Member of the Congress in 1975, and you

were, I think, at that same meeting, Henson. It was on energy issues with John Dingell, who had just assumed his first chairmanship—if you can imagine a point when John Dingell was not a chairman—and we were both there, and he was Chairman of the Energy Subcommittee over in the old Interstate and Foreign Commerce Committee, and the questions have been the same.

Let me jump through just a number of issues, if I might, with you.

First, on the issue of who is paying to help us defray the cost in the Persian Gulf. The cost of energy has gone up about \$10 a barrel in the last month, is that not about right—approximately correct?

Mr. MOORE. Yes, if you look at just before the invasion the price was settling in at about \$21 or \$22 a barrel by virtue of the action OPEC had taken prior to the invasion, and so assuming it is selling for \$32, that is right.

Senator WIRTH. Our U.S. costs there are estimated by Secretary Baker and Secretary Cheney to be about \$15 billion a year, and we have been much heartened by the fact that the Saudis have said that they are going to help pick up part of this cost, but I just want to examine where that money is coming from.

The Saudis are now getting \$10 a barrel more for their oil than they were before, and it is my understanding that the Saudis are exporting to us about 1.2 million barrels a day and that they produce a total of about 5 million barrels a day. If the Saudis are producing about 5 million barrels a day, they are getting \$50 million a day more than they got in July, is that not right? That oil is lifted 365 days a year, is it not?

Mr. MOORE. Yes.

Senator WIRTH. So if you have \$50 million a day times 365 days, the Saudis are in fact gaining revenues of about \$20 billion more annually than they were in July, is that not right?

For the Saudis then to say—I mean, we appreciate their generosity, but I think it is important for us to understand that after they pay for U.S. operations, their share of that, they have still got a very, very significant dividend left after that, and the American public ought to understand that. Are not those numbers about accurate?

I am not knocking the Saudis, but I think we just have to understand where the generosity is coming from. It is coming from the fact that oil prices have gone up because of this crisis by about \$10 per barrel per day.

Mr. MOORE. We would be happy to do those calculations for you, Senator.

Senator WIRTH. Those are awfully close. \$50 million a year times 365 days a year comes out to about \$20 billion a year, and our cost to have our forces there is \$15 billion. The Saudis say they are going to pay part of that cost. They have still got a lot of money left over, and I think it is useful for us to understand that there are an awful lot of new revenues that are going out of one pocket to another.

The second issue on numbers relates to transportation and the percentage of our oil that goes to transportation. Is it not true that about two-thirds of our oil consumption is used in transportation?

Mr. MOORE. Yes.

Senator WIRTH. Our transportation sector is almost exclusively dependent upon oil, is that not right?

Mr. MOORE. For wheeled vehicles, yes.

Senator WIRTH. So consequently, as you point out, if what we are looking for is immediate savings, those immediate savings are going to have to come in the transportation sector.

We can talk about the need to develop other long-term energy programs, which the national energy strategy wants to do, and you all are going to be pursuing and coming back to us in early next year, but our immediate need is to save oil, and the place where the biggest savings can occur is in transportation, is that not right?

Mr. MOORE. Yes.

Senator WIRTH. The next biggest sector is probably the building sector. That is the other place where probably there are some significant savings, but not nearly as significant as transportation. Transportation is the big one, as your recommendations point out here. Are we talking from the same base here?

Mr. MOORE. Yes. If you look at energy efficiency or conservation measures that you can enact very quickly that would have an impact on the amount of oil we are importing and consuming the things we have come up with all are directed in large part to transportation. We also have utilities, in trying to back out those utilities that are burning oil for electricity. That is a lesser amount, obviously, than the amount from transportation.

Senator WIRTH. So as we look at transportation, those of us who will be supporting increased efficiency for automobiles, that is the biggest area for savings. Here we are, we have got 100,000 troops in Saudi Arabia. We are there because of oil reasons. And clearly the biggest area of savings in transportation would be if people either drove less or we had more efficient automobiles.

Higher CAFE standards are not going to produce an immediate saving. Increasing fuel efficiency is not going to be an immediate saving, but it certainly is the kind of a long-term approach, again, to reduce our vulnerability on oil.

A second area we have not addressed today, is the clean air bill.

We talk about immediacy, one of the meetings that is going on as we are here is the Conference on Clean Air. The President had originally proposed that there be a million alternative fuel vehicles, on the assumption that we ought to be not only trying to clean up the air, but backing out oil. The administration backed off their original recommendation on the million alternative fuel vehicles and really softened that, I suppose, under their own analysis of what the energy industry was saying and what the automobile industry was saying.

There were many of us who felt that the President ought to have stuck to his original commitment. With the Iraqi crisis now upon us, is there any thought in the administration to return to the President's initial commitment to a million alternative-fuel vehicles, which unfortunately got lost during all of the negotiations?

Mr. MOORE. I do not think so, Senator. As a matter of fact, we are very concerned about the remaining measures in the conference that are very anti-energy production. The Clean Air bill is very important from a clean air point of view, but it has got mixed blessings in terms of what it does to energy.

Senator WIRTH. How has the commitment to alternative-fuel vehicles become contrary to energy production? I would think just the opposite.

Mr. MOORE. That one is not contrary. The alternative fuel provisions are one that do assist production. But the provisions on the mixture of gasoline and the WEPCO decisions, and others in there, are very troublesome.

Senator WIRTH. It would seem to me that if we are concerned about imported oil, and if the biggest consumer of oil is transportation, then we ought to do everything we can to limit the amount of oil being used in the transportation sector. Therefore, not only should we focusing long term on fuel economy standards, but we ought to be pressing as hard as possible on alternative fuels for transportation.

The President's original commitment of a million vehicles, it seems to me, is looking awful visionary now, and this is a great chance for him to recapture that vision and move once again toward, very particularly, encouraging much, much broader use of natural gas in our transportation sector.

Mr. MOORE. Senator, there are ways to accomplish that goal without going through what that bill does. And we are proceeding with those, and intend to do those in terms of research and in terms, as I mentioned a moment ago, of the President's announcement of buying and beginning to look at a more rapid conversion of vehicles in the Federal fleet—to begin to do some of the same things that that mandatory legislation would have accomplished. I think maybe the Administration might be willing to consider something like that if, in turn, those in the conference would give on some of these other provisions that are very troublesome to it.

Senator WIRTH. I do not know about where that mix is. And I am not a conferee.

Mr. MOORE. Nor am I.

Senator WIRTH. And I do not know what the mix of measures are. I know you are not in that discussion either. But it would seem to me this would be a great opportunity. And I raise this only in hopes that maybe you could take that back and say is not this an opportunity for us to really put a major emphasis on natural gas vehicles, and on other alternative fuels. Again, this is not something that is going to save energy tomorrow, but if the transportation sector is, as we know, the most sensitive and the most vulnerable to the kind of crisis that we now see in the Middle East, it would seem to be prudent for us to do everything we can. And maybe there are some other tradeoffs in conference that we ought to be pushing, and come back again to natural gas vehicles.

Mr. MOORE. We will certainly consider that.

Senator WIRTH. Another item on this front is Federal building standards. Just last summer Senator Johnston and I and a number of other people wrote to the President saying we thought—and this was, again, before Iraq—that it was time for us to really seriously address once again efficiency in Federal buildings. And again, the commercial sector watches in some ways what the Federal Government is doing in its building codes.

We had suggested that there be an executive order on efficiency in building standards. And again, I would think this might be the

sort of thing you would look at. You might want to go back and look at our letter. And we got a letter of response back from Mr. Grady at OMB. But all of this was before Iraq. And I think this might be another item that you might add to your list at this point, Mr. Secretary.

Mr. MOORE. Senator, as I mentioned earlier, and you may have missed it, that is anticipated to be coming out shortly in an executive order.

Senator WIRTH. Great. Terrific. I am sorry I did miss that. I am pleased to hear that.

The President the other night mentioned a number of needed incentives for the oil and gas industry, with which I very strongly agree. The question is how to pay for those. Are they going to be tax expenditures of one kind or another for the most part, and where is that going to come from at a time when we have this ballooning Federal deficit?

A couple of suggestions have been made, one an oil import fee, and the second, a gasoline tax. On the an oil import fee, does the administration have a position on the oil import fee? Is that looking like something that would appear to be a good idea? Or is that one of the options that you are going to come back to us on in the national energy plan?

Mr. MOORE. It is properly a decision for the Treasury Department to answer, rather than us. Although it involves energy and we do have a voice in such matters, they are the ones that announce the Administration's position on tax matters. Whether or not this will be considered as one of the options in the NES, the answer is yes. It was in the interim report as I remember, and therefore it will be one of the things looked at and on the list of options and what it will accomplish.

Whether or not the President will select that as an option, that is going to be his decision to make. And I cannot give you an answer on that. As far as I know right now, the Administration's position is in opposition to an oil import fee.

Senator WIRTH. I understand.

Mr. MOORE. What he will decide in December, I do not know.

Senator WIRTH. It just seems to me, in terms of the consistency of energy policy that Senator McClure and so many others have spoken about this morning in trying to develop an understandable and a predictable price base, having an oil import fee at a time when we could see the Persian Gulf jump up and down as and I have seen in the last 15 years, would be precisely the kind of thing that we ought to be doing if in fact we want to have the kind of long-term commitment to alternatives and a kind of stability in pricing that people can understand. If there were a floor of a sort of oil import fee, that would be understandable and a wise step for us to be taking.

But I know you know all of those arguments up one side and down the other. I am singing to the choir here. But just for the purposes of the record I wanted to put that out.

There is another variable on this, and that goes to gasoline taxes. Nobody likes to talk about gasoline taxes because it touches a nerve in the American public. And as Senator Wallop said, a lot of people feel that they are entitled to having cheap gasoline. But let

me go back, when you and I first came to the Congress in 1975, gasoline was selling at about \$1.35 a gallon for unleaded regular. That was in 1975 dollars. That would be a lot more today.

In fact, as oil prices went down, if we had had a national policy at that point that had said we are not going to let gasoline prices drop any lower than a \$1.35, we are already up and paying those as they were in 1975, and the American public was accustomed to paying those prices in 1975. We got through that price shock in the 1970's, and people got accustomed to doing that, and the harm to the economy was done, and we worked those higher gasoline prices into the economy.

Unfortunately, we did not have that kind of a floor and gasoline prices dropped again. We would have been a lot better off in terms of energy efficiency and in terms of revenues had we had a floor at that point, say, that gasoline prices did not drop below that. It is nice to look back at that, sort of Monday-morning quarterbacking. That would have been a good thing to have done, but we did not.

But we may have that opportunity again today. And again, as suggestions come to you, if you look at our experience in the 1970's, and again in 1990, what would happen if our budget negotiators out at Andrews were to talk about well, why do not we put into this budget agreement a floor on gasoline prices. That gasoline prices will not go any lower than they are today. And therefore, if the Iraqi crisis comes to an end, or if massive international conservation efforts drop the price of oil, which as you and I know could happen very quickly, we could have a plunge in oil prices very rapidly, we would then still have the accustomed higher prices with the conservation effect that that has, and with the revenue effect.

And politicians can then say, well, the prices were already up there, we did not raise new taxes, and so on. It seems to me that that could have a very real good economic impact. It could have a very good energy and conservation impact. And it could be a kind of an approach that would be politically more palatable.

There is no reason for you to react on tax policy, I understand, but maybe that is something that you might want to put in the mix. I have talked to a number of the negotiators about that idea, and they think maybe this has a little bit of promise and we might put that one into the mix.

Mr. MOORE. I do not know what they are considering, but from what we read in the papers the budget negotiators are looking at energy taxes and gasoline taxes. So we will have to see what they deliver to us and whether or not it is something the President can sign.

What you say is certainly logical. I would simply point out that there are those economists who would say that in the periods of low gasoline prices, low energy prices, while it did not do much for energy conservation—maybe it was antithetical to conservation—it did help with growth and economy. So while we lost on the one side of the ledger, it was not a total loss. You got a gain on the other side of the ledger.

That is not for me to decide. That is a matter for the—

Senator WIRTH. The big shock that we were worried about is the inflationary shock and the harm to the economy when prices go up. We already absorbed that, and we are in the process of absorbing it

again. Having taken that loss and absorbed it in the economy, if we could figure out how to hang on to that, it seems to me that might be a productive thing to do.

The final question while Senator Murkowski is here, we have had a lot of discussions over the last 3 or 4 years on the subject of ANWR. There are a lot of buttons around. The night of the President's address I saw "ANWR Si, Iraq No" and things like that.

I would suspect that Senator Murkowski may have some different views on this, but I just wanted to point out for the record that the testimony we had from the Interior Department said that the chances of finding any producible oil were 1 in 5. I think we should understand that while a lot of people have suggested that we will be okay if we just drill in ANWR, that probably is not the case.

Second, testimony to this committee also established that at least 10 years would pass between the leasing of ANWR and first oil production. So again, a long lead time and the distinction you made this morning: what do we do now, versus long-term propositions; ANWR does not produce us out of this.

Third, is that ANWR production would peak, if the Interior Department was correct, at about 650,000 barrels per day. Kuwait and Iraq are producing more than 4.5 million barrels per day, or about seven times more. So ANWR is relatively small compared to what we are talking about in Iraq and Kuwait.

The reason I am bringing all of this up is to again focus on the long-term energy strategy. It may be that in conjunction with a whole lot of other things—and I have said this many times in the past—it may be that drilling ANWR is necessary, but there are a whole variety of other things that we ought to be doing. If we are going to do ANWR we ought to be doing a major conservation program. If we are going to be doing ANWR we ought to be doing a major incentive program for other production. If we are going to do ANWR we ought to be doing a major natural gas program. If we are going to do ANWR we ought to do a major program for alternative fuels. If we are going to do ANWR we ought to do a major program to see if we can move ourselves away from this oil-based transportation economy; for example, thinking very seriously about the potential of a solar hydrogen complex that would provide us with very real alternatives in the 21st Century.

I raise that only to put ANWR in perspective. Senator Murkowski may have some different views on that. I do not want to put words in his mouth. He and I have discussed this any number of times in the past, but I just wanted to lay that out at this point for the record.

I had a number of other things that I wanted to chat with you about, but I know Senator Murkowski has waited very patiently here. There will be additional questions for the record, as you know, and the committee would ask that all members submit their questions to the committee by close of business tomorrow for submission to the Department of Energy.

Henson, again I really appreciate your being here. I do have a feeling of *deja vu*. I hope we do not have to go through this again. Maybe we will learn the lessons that Senator McClure so eloquently stated earlier and develop this kind of long-term template that I think everybody in this room knows we ought to.

Thank you very much for being here.

Mr. MOORE. Mr. Chairman, I would like to reply just for a moment.

You are right. It is *deja vu*; we have seen this before. I think members of this panel have pointed out what is different. What is different is there is a SPRO. We are far better able to protect America than we were in 1973 and 1979. I think that is one reason why you have not seen panic in the United States.

The second thing is I think because we have been through it before we are better accustomed to how to respond to this as a people and as a government.

Third, regarding the national energy strategy, this may really be a blessing in disguise, in that while you have an interest in the National Energy Strategy, we both know this was not exactly the number one issue in the minds of the American people or the Congress. Now by virtue of this, the silver lining is that maybe there will be the impetus now to really give serious consideration to an all-encompassing strategy for which we can build a consensus in the Congress and then have a game plan begin to be in place.

It may have come to you all at once, but at least you have a mural that is painted by the numbers. As we get something done, you color in that number. Pretty soon, maybe 10 years down the line, you suddenly have a picture completed by the Congress. We view ANWR that way. We did not start ANWR; this committee did. That legislation has been pending in the Congress. What the President referred to the other night was, well, maybe we ought to think about now working to try to find a way to pass it.

Your numbers on ANWR are those that I have become familiar with, and I think that everything you say is right, but there is always another way to look at it numerically. The 1 in 5 chance of finding oil is considerably better than you normally find in an oil field unless you are drilling a development well.

When you say the fact that there is only 600,000 barrels per day that may come from this, we were only importing 730,000 barrels from Iraq and Kuwait together before the cutting off of those imports.

You do not know until you drill, and I do not know what harm there would be in drilling. If there is nothing there, then we pack up and go home and there has been nothing to worry about. If you do find it, the potential is there to be the biggest oil field in the United States. If you take all of the on-shore fields discovered in the United States, they are less than 1 day of our consumption. You can play with the numbers.

I think that what you are trying to say and with which I agree is the same thing Senator McClure said: there are no silver bullets. There is no one thing we can do to solve the problem. You ticked off the things that have to be done. We have to work in conservation. We have to work in natural gas and fuel switching. We have to work in renewables, and we also have to look at what we can do to in the interim go ahead and produce the conventional things we have that can be done environmentally satisfactorily.

So I accept that thesis you are making as being absolutely right. I do not think you are going to see ANWR legislation passed that does not address these concerns. I think that you will see a nation-

al energy strategy will never become a true operative strategy unless it addresses all these concerns.

Senator WIRTH. I appreciate those comments and the fact that energy is now back on the agenda. I was most pleased with the President's address the other night. That was the thing that I found the most heartening in his very good speech before the Congress.

Excuse me, Frank, but I just want to get a comment on one final question.

We passed out of this committee and then the Senate passed in August the National Energy Policy Act of 1990. That is legislation which I originally drafted and we passed out of here unanimously. We have not gotten a formal response from the Department of Energy about what parts of that you like and do not like.

Would it be possible to do that? We are working with people in the House now to see if we can get that through the Energy Committee and the Science Committee over there. There are parts of it I know you are very much behind, and maybe we ought to make sure that those are brought to the attention there. We might be able to work together to see if we can get that legislation passed.

The President talked the other night about getting legislation through the Congress in September. This is a major piece of legislation that is right out there. We worked a lot on this together. We do not have a formal statement from DOE, and maybe you do not want to state a formal position. Perhaps we could get a response from the Department about which parts make the most sense to you and which ones we ought to push harder in the House to pass, whatever you think would be appropriate.

I have been working closely with our former colleagues on the Energy Committee and on the Science Committee over there to see if we can get that legislation passed. I think that fits the bill of what the President was asking for as well on Tuesday night.

Mr. MOORE. I was on the House side discussing with the staff and the chairman of that committee some of those very things yesterday. Deputy Under Secretary Linda Stuntz is testifying today on that bill. Your request is a reasonable one, and the answer to it is yes, we will certainly work with you.

[Subsequently the Department of Energy submitted the following:]

THE SECRETARY OF ENERGY,
Washington, DC, October 1, 1990.

Hon. ROBERT A. ROE,
Chairman, Committee on Science, Space, and Technology, U.S. House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: This is in response to your letter of September 12, 1990, requesting our views on H.R. 5521, the "National Energy Policy Act of 1990." On September 13, 1990, Linda Stuntz, Deputy Under Secretary for Policy, Planning and Analysis, testified on titles I, II, and IV of H.R. 5521 before the Energy and Power Subcommittee of the House Committee on Energy and Commerce. A copy of her statement is enclosed.

The Department of Energy is leading an interagency effort to build a National Energy Strategy. The Strategy will be based on the policy of market reliance, and enhance environmental quality consistent with achieving economic and security objectives. Accordingly, we support the intent of H.R. 5521 to assure that the environmental consequences of energy production, transportation, and use are fully considered in developing national energy policy. Furthermore, we support many of the

conservation and energy efficiency initiatives contained in the bill. Nonetheless, in addition to the concerns set out in the attached testimony, our specific objections are as follows.

We oppose provisions in title I that require the preparation of a least cost national energy strategy. This requirement assumes the Federal government can determine by some known calculus what combination of resources satisfies everyone's energy needs at the "least cost," taking into account all energy, social, economic and environmental factors in every region throughout the country. It further assumes the Federal government can intervene in energy markets to assure the provision of that special combination of "least cost" resources. Both of these assumptions are untenable. There is no agreed upon method to calculate one "least-cost" plan as envisioned by the bill. In fact, there could be many so-called "least cost" plans, depending on assumptions made about the future and the interplay among the myriad of economic, social, and environmental factors that influence and are influenced by, energy policy.

We also oppose any requirement to develop a national energy strategy that is designed to achieve unilateral CO₂ stabilization or reduction by the United States. Assuming that clear scientific evidence is obtained to indicate that global climate change trends present a problem, a coordinated international approach will be required to deal with this issue. Unilateral action by the U.S. will not materially affect global greenhouse gas emissions, but it could have significant adverse domestic consequences. Indeed, it is conceivable that such a unilateral action would actually increase worldwide CO₂ emissions, if the economic response of the worldwide economy were to move production of emissions-intensive products from the United States to other countries where manufacturing production is more emissions-intensive. Moreover, should international consensus be reached on greenhouse gas emission controls, any subsequent national plan must consider all sources of such gases, not just those associated with energy use, as well as all sinks. Finally, such a plan must fully recognize the differences among greenhouse bases.

We oppose title III, as currently drafted. It attempts to micromanage energy research through numerous prescriptive requirements. On August 28, 1990, DOE submitted to Congress the National Research Council report entitled "Confronting Climate Change: Strategies for Energy Research." The Council calls for flexibility in research programs and is critical of excessive government intervention in the "... specifics of program design and implementation."

Unfortunately, title III does not provide sufficient flexibility to adjust to new needs, new knowledge, or changing priorities. Several sections specify particular technologies that must be pursued. For example, in section 312, three types of gas turbines are singled out for research and development. Section 341 lists eight coal technologies for specific study. Section 353 enumerates fifteen areas for inclusion in a vehicle research program including lubricants, carburetion, and manifolding.

We believe this level of prescriptive direction is not an efficient or effective way to conduct a research and development program, especially given the numerous planning and reporting requirements found throughout the title. These requirements do not provide for the consideration of comparative costs and benefits, thereby giving DOE little ability to ensure that the taxpayers are getting the most return for their research dollar. We also are concerned about the costs of title III. The potential scope of section 331 alone, the fusion demonstration section, are so great that reasonable estimates of the total cost of this title cannot be made. By requiring that both magnetic and inertial confinement technologies be carried through the demonstration phase, the bill would call for the expenditure of vast sums, even if the production of electricity from one or the other technology appears far more feasible prior to reaching demonstration.

Similarly, we question why the Federal government should be required to carry out research that is already being done by the private sector. For example, there does not appear to be a clear need for the devotion of Federal research and development resources to automobile engine ignition systems and fuel combustion, given the substantial private sector resources being expended in this area.

Finally, we are concerned that there seems to be no consideration in title III of the Department's existing research and development programs. It is not clear to us how our current programs would fit with the new programs required by title III. Where there are conflicts or inadequate resources, should continuing research be abandoned in favor of that required by the bill?

We welcome the opportunity to work with the Committee to develop a scientifically, economically and environmentally sound research and development program to provide the underpinnings of an equally sound national energy policy. If

amended as suggested, H.R. 5521 could represent a positive step toward achieving these central objectives of energy policymaking for the 1990s and beyond.

The Office of Management and Budget advises, that from the standpoint of the Administration's program, there is no objection to the submission of this letter.

Sincerely,

JAMES D. WATKINS,
Admiral, U.S. Navy (Retired).

[Enclosures.]

SUMMARY OF ADMINISTRATION VIEWS ON H.R. 5521, THE NATIONAL ENERGY POLICY ACT OF 1990

We support the intent of H.R. 5521 to see that the environmental consequences of energy production, transportation and use are fully considered in developing national energy policy.

We are developing a National Energy Strategy (NES) that enhances environmental quality consistent with achieving economic and security objectives.

We cannot support H.R. 5521 unless it is amended to eliminate several prescriptive and costly provisions.

The Administration opposes the requirement that future National Energy Plans include a strategy for achieving specific targets and timetables for the reduction of carbon dioxide emissions.

Any legislated targets or timetables would be ill-advised given the large uncertainties regarding the scale, timing, and impacts of climate change, and the serious economic consequences of such actions. Requirements for unilateral United States action on carbon dioxide alone would have little or no effect on the potential for global climate change, and would undermine our efforts to negotiate an International Framework Convention on Global Climate Change. Strategies to respond to potential climate change should be based on international consensus. Strategies must address both sources and sinks of all greenhouse gases, and should include mitigation and adaptation measures.

Although we believe it is important and appropriate to expand the role of the Committee on Renewable Energy Commerce and Trade (CORECT) in helping make energy efficient technology available to developing countries, we oppose the establishment of new financial incentives, including loan guarantees, to commercialize and export renewable energy and energy efficiency resource technologies.

We also oppose the sweeping provisions in Title III of H.R. 5521 that would require the Federal Government to provide substantial subsidies for the demonstration and commercialization of a variety of new energy technologies. These requirements may not be technically achievable, could cost at least several hundred million dollars annually, and are too rigid to permit priority setting.

PREPARED STATEMENT OF LINDA G. STUNTZ, DEPUTY UNDER SECRETARY FOR POLICY,
DEPARTMENT OF ENERGY

Mr. Chairman, I appreciate the opportunity to present the views of the Department of Energy on H.R. 5521, the National Energy Policy Act of 1990.

OVERVIEW

We are developing a National Energy Strategy (NES) that enhances environmental quality consistent with achieving economic and security objectives. We support, therefore, the intent of H.R. 5521 to see that the environmental consequences of energy production, transportation and use are fully considered in developing national energy policy. However, we cannot support H.R. 5521 unless it is amended to eliminate several prescriptive and costly provisions that I will discuss in my testimony.

Specifically, the Administration opposes the requirement that future National Energy Plans include a strategy for achieving specific targets and timetables for the reduction of carbon dioxide emissions. Any legislated targets or timetables would be ill-advised given the large uncertainties regarding the scale, timing, and impacts of climate change, and the serious economic consequences of such actions.

Further, requirements for unilateral United States action on carbon dioxide alone would have little or no effect on the potential for global climate change, and would undermine our efforts to negotiate an International Framework Convention on Global Climate Change. Strategies to respond to potential climate change should be based on international consensus, taking into consideration the socioeconomic and

environmental impacts of climate change, the socioeconomic effects of mitigation strategies, and the effectiveness of such strategies in reducing potential adverse climatic impacts. Strategies must address both sources and sinks of all greenhouse gases, and should include mitigation and adaptation measures, rather than narrowly targeting energy-related carbon dioxide emissions. Initially, such strategies should focus on actions which are fully justified for reasons other than climate change.

We also oppose the establishment of new financial incentives, including loan guarantees, to commercialize and export renewable energy and energy efficiency resource technologies. In addition, while we support research and development activities on a wide range of energy technologies, we oppose the numerous targets, schedules, authorization levels, and prescriptive planning and micro-management requirements contained in the bill.

Finally, we oppose provisions that would require the Federal Government to provide subsidies for the demonstration and commercialization of new energy technologies. These requirements may not be technically achievable, could cost at least several hundred million dollars annually, and are too rigid to permit priority setting. The specific technical objectives for energy research and development programs, and program priorities, should be addressed in the more comprehensive and flexible framework of the Administration's NES report to Congress next year and in future updates of the NES.

1. We Are Developing a Comprehensive National Energy Strategy

In July 1989, the President directed the Secretary of Energy to lead the development of a National Energy Strategy relying on market forces and balancing: (1) our increasing need for energy at reasonable prices; (2) our commitment to a safer and healthier environment; (3) our determination to maintain an economy that is second to none; and (4) our goal to reduce dependence by ourselves and our friends and allies on potentially unreliable energy suppliers.¹ The current situation in the Middle East underscores the wisdom of the President's emphasis on balance. A National Energy Strategy will not succeed if any one of these four elements is ignored or made preeminent.

The Department is building a National Energy Strategy using an open, deliberative process. Within the Executive Branch, DOE is working with an interagency group created by the President's Economic Policy Council. This will assure that our multiple national objectives—environmental, economic, scientific, educational, budgetary, commercial—are represented in energy policy formulation. The external process involves those most immediately affected by the policy decisions we make at the Federal level, including State and local governments and consumers. We hope that this process will help us build a consensus for new approaches to energy policy issues that have divided this Nation for the last decade.

2. Relationship of Global Climate Change to the National Energy Strategy

Potential global climate change has received considerable attention during our 18 NES hearings. In hearings in Atlanta, co-chaired by Environmental Protection Agency Administrator Reilly, and in Washington, D.C., co-chaired by Dr. Alan Brouley, entire panels representing various views were devoted to global climate change concerns and the appropriate energy policy response. The chapter on global environmental issues in the Interim Report is based on this public hearing testimony and on written submissions.

The Secretary also has had the National laboratories prepare several analytical papers to address certain energy and environmental issues that play prominent roles in global climate change response strategy discussions. These analyses are not intended to be the last, or the only, analyses we rely on in the areas of efficiency and renewable energy potential, technology transfer, and global climate change science, but they do provide useful points of reference for the issues we are discussing here today.

3. What We Know and Do Not Know About Global Climate Change, as Reported by the IPCC in its First Assessment

The U.S. is playing a leadership role in the Intergovernmental Panel on Climate Change (IPCC). The IPCC was established in November 1988 under the joint auspices of the United Nations Environment Program and the World Meteorological Organization to assess the science of climate change, its socioeconomic impacts, and to identify possible response strategies. The U.S. has been active in all three areas and chairs the IPCC's Response Strategies Working Group, which was tasked with developing policy and technology response options.

The IPCC's First Assessment Report was finalized at the Fourth Plenary Session of the IPCC held in Sundsvall, Sweden from August 27-30, and will be available in a few weeks. The report and its underlying documents lay out initial findings; identify possible response options for consideration by policy makers; and identify areas where further analysis is needed to resolve the many uncertainties surrounding climate change.

The key findings are:

—In regard to science, the report concludes that emissions resulting from human activities are substantially increasing the atmospheric concentrations of greenhouse gases, and that these increases will enhance the greenhouse effect, resulting on average in additional warming of the Earth's surface. Based on various current model results, the report indicates that the global mean temperature could increase by 0.1 to 0.3 degrees C per decade during the next century, looking at a variety of hypothetical emissions scenarios. The report notes, however, that there are many uncertainties in these predictions, particularly with regard to the timing, magnitude and regional patterns of climate change. This is due to our incomplete understanding of sources and sinks of greenhouse gases, and the responses of clouds, oceans and polar ice sheets to a change of radiative forcing. This report also notes that the various greenhouse gases have different radiative importance.

—In regard to impacts, the report assesses the possible effects of climate change on a variety of systems, including agriculture and forestry, natural terrestrial ecosystems, water resources, human settlements and oceans and coastal zones. It estimates, for example, that climate change could have an important effect on agriculture, but the experts were unable to determine whether global agricultural potential will increase or decrease. The report notes that comprehensive estimates of the physical and biological effects of climate change at the regional level are difficult, that confidence in regional estimates is low, and that the impacts work of the IPCC highlights our lack of knowledge both at the regional level and in areas most vulnerable to climate change.

—In regard to responses, the IPCC identifies a number of response options, but did not analyze the economic and social impacts of these responses or their technological and commercial feasibility. The report acknowledges the considerable uncertainties facing policy makers, both in regard to the science of climate change and in regard to our understanding of the costs, economic effects and other implications of response options. In the face of these uncertainties, but also recognizing that the potential threat of climate change justifies taking certain actions now, the report identifies important criteria for developing response strategies. The most effective strategies include those which are: (1) beneficial for reasons other than climate change and justifiable in their own right; (2) economically efficient and cost effective; and (3) flexible and phased so that they can easily be modified to respond to increased understanding of climate change. The report notes that limitation and adaptation measures must both be considered as an integrated package, and that a comprehensive approach to all of the climate issues is necessary. Finally, the report points out that both industrialized and developing countries must commit to address this issue if responses are to be effective.

The IPCC report concluded: "The consideration of climate change response strategies, however, presents formidable difficulties for policymakers. On the one hand, the information available to make sound policy analyses is inadequate because of: (a) remaining scientific uncertainties regarding the magnitude, timing, rate, and regional consequences of potential climate change; (b) uncertainty with respect to how effective specific response options or groups of options would be in actually averting potential climate change; and (c) uncertainty with respect to the costs, effects on economic growth, and other economic and social implications of specific response options or groups of options. The potentially serious consequences of climate change on the global environment, however, give sufficient reasons to begin by adopting response strategies that can be justified immediately even in the face of such significant uncertainties."

The IPCC also concluded that climate change is a global issue that will require a high degree of international cooperation and, hence, that it is important for a framework convention to gain the adherence of the largest possible number of countries.

4. We Are Making Substantial Efforts to Better Understand Global Climate Change and to Reduce Greenhouse Gas Emissions

The IPCC Assessment reflects the key features of the U.S. approach to potential global climate change. The elements of that approach include the following measures.

(a) Enhancing scientific and economic research to help resolve the many remaining uncertainties. The Administration has requested a global change research budget in FY 1991 of \$1.034 billion, a 57 percent increase over FY 1990. The U.S. Global Change Research Program is by far the largest such program in the world.

(b) Taking actions now which are justified for other reasons, such as enhanced energy efficiency, phasing out CFCs and promoting cleaner use of fossil fuels. For example, CFC's constituted 25 percent of global greenhouse gas emissions in the 1980s. Phasing out CFC's, halons and carbon tetrachloride by the year 2000, and methyl chloroform by 2005, as we have urged and as the international community agreed to do in London last June, will help reduce greenhouse gas emissions and protect the stratospheric ozone layer.

The Clean Air Act amendments currently being considered by the Congress would also reduce emissions of some greenhouse gases, such as CO₂, VOCs, SO₂ and nitrogen oxides. They would also reduce emissions of materials such as carbon monoxide and volatile organic compounds which chemically react to generate greenhouse gases such as tropospheric ozone. These reductions, and the strong energy conservation incentives created by the amendments, will result in substantial reductions of greenhouse gas emissions.

In addition, the President has announced a program to plant over one billion new trees per year. Over the lifetime of one billion new trees, they will annually sequester about 13 million tons of carbon per year. This program has the potential, if continued for 20 years, to sequester up to 5 percent of annual U.S. carbon dioxide emissions. The President proposed, at the Houston Summit, to begin negotiations on a global forest convention which is needed to curb deforestation, protect biodiversity, stimulate positive forestry actions, and address threats to the world's forests. Such a convention would also help to reduce net emissions of greenhouse gases.

To improve energy efficiency, which in many cases, also has the effect of reducing greenhouse gases, DOE is pursuing initiatives to promote efficient lighting, the adoption of standards in Federal and commercial buildings, increased energy audits and increased use of energy efficient building standards by the Department of Housing and Urban Development (HUD) in public housing programs. DOE initiatives to expand the use of hydropower and promote cost effective renewable energy options will lead to additional reductions in greenhouse gases.

In total, DOE efficiency and renewable initiatives, Clean Air Act amendments, U.S. reforestation initiatives and the phase-out of CFC's will reduce greenhouse gas emissions in the U.S. by more than 20 percent from what they otherwise would have been by the year 2000.

(c) Seeking comprehensive, multilateral response agreements. The U.S. will host the first negotiating session for a framework convention on global climate change in February 1991. Preparations for these negotiations are underway.

(d) Fostering a comprehensive approach to climate change. Several gases contribute to potential climate change, among them CO₂, NO_x, CFCs, and O₃. These gases are emitted by a variety of sources and absorbed by many different sinks. Any global climate change response strategy must address the system as a whole, rather than focusing piecemeal on one gas or sink. A comprehensive approach would be both more environmentally effective and more economically efficient. In addition, any response measures should rely upon market-based economic instruments, rather than command-and-control regulations.

5. DOE is Taking Additional Actions to Address Global Climate Change

In addition to the items mentioned above, DOE has taken several other actions related to global climate change.

(a) The most recent Clean Coal Technology solicitation (CCT-3) contained evaluation criteria that credited efficiency increases. We intend for the CCT-4 solicitation to focus on high efficiency systems and to provide extra credits to proposals that address CO₂ reduction.

(b) The Department has entered into two contracts, with Westinghouse and General Electric, to continue development of two advanced, midsize nuclear reactors that maintain safe operations through natural or passive systems. These reactors are expected to be certified by the NRC as approved plant designs by 1995, and could be utilized thereafter to generate electricity without greenhouse gas emissions. In addition, DOE supports R&D on modular, advanced reactor concepts that could provide the basis for meeting the Nation's energy needs in the next century in an economically and environmentally sound manner.

(c) DOE's Office of Energy Research has recently begun two major research efforts aimed at addressing key weaknesses in our understanding of global climate change. The first, called the Atmospheric Radiation Measurement (ARM) program, will im-

prove our understanding of the radiation balance in the earth's atmosphere. This is especially important for determining the role of clouds in climate change. The second initiative, entitled the Computer Hardware, Advanced Mathematics and Model Physics (CHAMMP) Program, is directed at developing the next generation of climate models. This effort will take advantage of state-of-the-art computing methods and hardware to build an advanced climate model which can more effectively address regional scale climate issues. An initial phase of this program attempts to determine the feasibility of improved prediction and to determine what can realistically be expected from such predictions. The DOE budget request for global climate change research in FY 1991 is \$66 million, up from \$17 million in FY 1989.

(d) DOE has been very active in the working groups and subgroups of the IPCC. As examples:

- Over 30 DOE-sponsored scientists participated in the Working Group I report on the science of climate change; and

- DOE played a major role in the Energy and Industry Subgroup Report to Working Group III on Response Strategies Working Group (RSWG).

(e) Lastly, DOE has organized its global climate change related activities to respond to the analytical and policy development needs of this rapidly moving issue. The Secretary has assigned leadership for DOE's policy development activities on climate change to the Office of Policy, Planning and Analysis (PE) and to the Office of International Affairs and Energy Emergencies (IE). PE will have the lead in conducting analysis of climate change response strategies and in policy development. IE will coordinate and manage DOE's participation in international climate change activities. The Office of Energy Research continues to lead our climate research program. An Assistant Secretary-level Global Climate Change Executive Committee (GCCEC) and a supporting staff level group that includes all relevant DOE elements have been organized to coordinate DOE activities on climate change. The Deputy Under Secretary for Policy, Planning and Analysis and the Assistant Secretary for International Affairs and Energy Emergencies jointly chair the GCCEC.

The core of DOE's response to the potential for global climate change is its technology development programs. All technology program offices are actively involved in the GCCEC and are re-evaluating their R&D and demonstration programs in light of the potential for climate change. The National Research Council has just completed an assessment of Federal energy technology R&D activities, in the light of potential global climate change, as required by the FY 1989 Energy and Water Appropriations Act. The NRC study, DOE's ongoing reassessments of programmatic priorities, and the substantial effort being devoted to the National Energy Strategy will provide the tools necessary for the Secretary to make any needed improvements in the technology R&D and demonstration programs.

These activities are examples of Administration responses to potential global climate change. It should be clear that our response is not limited to improving science over a multi-year time frame, although improving our understanding of the process of global climate change is, and must continue to be, a top priority. The Administration's response also includes specific actions which will have the effect of reducing greenhouse gas emissions. Those actions, however, serve other policy objectives and thus make sense, even if the potential for human-induced global climate change does not turn out to be as much of a concern as some have postulated.

6. Evaluation of H.R. 5521

With this background in mind, let me now address Titles I, II, and IV of the bill.

Title I

Title I emphasizes a "least cost" national energy strategy. The bill seems to assume that we know for each energy resource, now and in the foreseeable future, "all costs of production, transportation, and utilization . . ." This approach fails to recognize the diversity of circumstances and needs across regions, energy uses, and energy users themselves that will lead them to a variety of energy use strategies which could not be anticipated in one sweeping "least cost" plan. The Administration believes that a policy of continued market reliance, complemented by those interventions necessary to remove market impediments or reflect environmental and energy security externalities, is a better foundation for a successful NES than adoption of a centralized planning approach.

Valuations of the many economic, environmental, social, and energy variables that must legitimately be considered in the formation of any comprehensive energy strategy is often a highly controversial exercise. Virtually any plan can, for some set of assumptions, be characterized as a "least cost" approach. For this reason, there is a danger that the "least cost" concept will be used as a justification for particular options rather than as a decision rule for making unbiased choices.

The Administration approach to the NES is to identify specific impediments and externalities that arise in energy markets, and to the extent feasible, quantify their effects on energy use decisions. Once impediments are removed and externalities accounted for, it is better to let the judgment of American consumers, rather than the judgment of federal officials, determine energy use decisions.

We are working to develop information on the total fuel cycle costs of different energy resources. The NES approach is to work forward from specific, identifiable, market impediments or externalities to determine the extent to which private costs and societal costs of various energy resources may differ.

Pursuant to Congressional direction, we already are investigating the feasibility and consequences of stabilizing or reducing U.S. generation of greenhouse gases. We strongly oppose directions to develop an energy strategy to stabilize and eventually reduce U.S. generated greenhouse gases, without regard for what other nations are doing, as we read section 101(b)(1)(B) to require. The state of the science, and the limited effectiveness of any unilateral greenhouse gas mitigation activity, make such a directed National Energy Strategy wholly inappropriate.

The fractional U.S. generation of CO₂ has fallen from nearly 45 percent of global CO₂ emissions in 1950 to about 23 percent in 1987. A recent study done for the United Nations further underscores the shrinking role of the U.S. as a source of greenhouse gases. For 1987, it attributed 17.6 percent of greenhouse gases to the U.S., 12 percent to the USSR, 10.5 percent to Brazil, 6.6 percent to China, and 3.9 percent to India. Moreover, it found that Brazil's net CO₂ emissions exceeded those of the U.S. because of deforestation. U.S. CO₂ emissions are an even smaller share of global greenhouse emissions—only 12%. Thus, the effect on global greenhouse gas emissions of unilateral U.S. actions and controls on CO₂ would be small.

It should be borne in mind that unilateral actions to reduce U.S. greenhouse gas emissions may, under certain conditions, be either ineffective or conceivably even counterproductive in terms of their effects on world greenhouse emissions. The world-wide economy may respond to U.S. reductions in the production of emissions intensive products by increasing such production, and emissions, outside of the U.S. Under some circumstances, such economic responses could actually increase world-wide emissions. For this reason, the world-wide implications of such actions need to be carefully considered.

It is also inappropriate to narrowly target energy-related emissions as the means for meeting greenhouse gas emission reduction goals. Should international consensus be reached on a greenhouse gas control strategy, national policies must consider all sources and all sinks. Further, they must provide for full recognition of the differences among the various greenhouse gases, both in their effects on climate change and their costs of reduction.

In contrast to its minimal impact on global greenhouse gas emissions, unilateral U.S. greenhouse gas reductions could be very costly, in both economic and social terms. Like our understanding of global climate science, our ability to estimate the costs of reducing greenhouse gas emissions is an area which needs considerable improvement to support informed policy choices. By one estimate, however, restricting carbon emissions to their 1990 levels through the year 2000, reducing them to 80 percent of that level by 2020, and thereafter maintaining them at that level was estimated to cost 5 percent annually of our GNP by the year 2030.¹ Although some dispute these conclusions, it is clear that unilateral greenhouse gas reductions by the U.S. would be extremely costly and not very effective.

Title II

Title II addresses energy efficiency initiatives. The clearest single message the Department has heard from the public during the process of developing the National Energy Strategy is that we must seek ways to increase energy efficiency in every sector of energy use. We are heeding that message. The requirement in section 201, that we submit periodic reports on policy measures necessary to decrease energy use per unit of GNP by certain amounts, will neither substantially change the energy efficiency objectives that the nation must pursue nor provide particularly useful information. Energy consumed per unit of GNP is only one, imperfect measure of energy efficiency. It is as much a function of the composition of our economy, our geography and the lifestyles of our citizens as it is of the efficiency with which we use energy.

Section 202 addresses energy intensive industries. Industries for which energy is a substantial cost input already have ample financial incentives to save energy. Be-

¹ CO₂ Emission Limits: An Economic Analysis for the USA. Allan S. Manne, Stanford University and Richard G. Richels, Electric Power Research Institute, September 1989.

tween 1974 and 1985, energy efficiency increased by an average of 27.5 percent in the five most energy intensive industries. The chemical industry registered efficiency gains of 38 percent during this period, and the petroleum and coal industries had gains of 47 percent. Industrial machinery registered the largest efficiency gains of 54 percent. The Department is moving aggressively to identify and remove barriers to achieving further efficiency gains. Thus, although we support the intent of the section, we believe additional legislation in this area is unnecessary.

The Department welcomes the Committee's support for strengthening the Federal Energy Management Program. We recommend, however, that the discounted payback period for investment be reduced from ten years to five years. This is consistent with private sector investment objectives and will make the best use of scarce Federal funds. DOE estimates that the current provision would require initial increased annual Federal expenditures of more than \$400 million, although the resulting energy cost savings would offset these increased expenditures over time.

The procurement reforms set forth in the bill should help the Federal Government better take advantage of shared energy savings contracts. It should be recognized, however, that these contracts are no substitute for adequate funding to pay for the retrofit activities necessary to make substantial improvement in Federal energy efficiency.

The Department supports sections 205 and 206 of the bill which allow utilities to install residential conservation measures and establish programs window energy efficiency labelling.

We believe that electricity demand side management has been discouraged, in some cases, by the regulatory environment, as well as by various market barriers. Thus, we support state efforts to remove regulatory disincentives to electricity end-use efficiency. It is not appropriate, however, for the Federal Government to dictate that any or all utility investments in demand side management measures should be "as profitable" as investments in new generation facilities. The risks, and effects on real utility costs, of these activities are different, even within the same category of activities. Particularly in light of the substantial state activity in this area, such a sweeping Federal dictate is unwarranted and could be counterproductive.

In fact, the National Association of Regulatory Utility Commissioners (NARUC) recently adopted a resolution (attached) opposing Federal demand side management dictates of the type represented in Subtitle B. DOE agrees with NARUC that the extent and form of incentives to promote demand side management should remain the province of State regulatory commissions. After we have completed the report required in section 211(b), we would be in a better position to determine what, if any, Federal rate prescription is appropriate in this area.

Title III

Mr. Chairman, you asked that I focus my testimony today on Titles I, II, and IV. Consequently, I will say only that while the Administration supports research and development activities on a wide range of energy technologies, we believe Title III is seriously flawed. It would require the expenditure of very large sums of money on projects that may prove to be infeasible or not necessarily deserving of scarce Federal resources. It restricts the Secretary's ability to prioritize among competing research projects as needs, knowledge, and budgets change. Finally, it contains numerous burdensome reporting requirements.

The specific technical objectives for energy research and development programs, and program priorities, can be best addressed in the NES to be presented to Congress early next year, and in future updates of the NES.

Title IV

Much of the methane analysis required by subtitle A is already under way at the EPA. Expanding the duties of the Committee on Renewable Energy Commerce and Trade (CORECT), as Subtitle B would do, is important and appropriate. However, the Administration opposes the establishment of new financial incentives, including loan guarantees, to commercialize and export renewable energy and energy efficient technologies.

We support the requirement for the development of comparative international fuel cycle costs. A joint effort to produce such analysis is underway between the Department and the European Community.

CONCLUSION

Mr. Chairman, we appreciate the opportunity to work with the Committee to develop energy policies that will sustain economic growth, maintain affordable energy, stimulate technological innovation and improve environmental quality.

If amended as I have suggested, H.R. 5521 could represent a positive step toward achieving these central objectives of energy policy making for the 1990s and beyond.

RESOLUTION ON LEAST-COST PLANNING PROVISION IN GLOBAL WARMING LEGISLATION

WHEREAS, A Least-Cost Planning amendment to the Public Utility Regulatory Policies Act (PURPA) has been included in the legislation that addresses global warming; and

WHEREAS, This amendment creates a new ratemaking standard under Section 111 of the PURPA that would require State utility commissions to consider making utility investments in demand-side management (DSM) as profitable as investments in new generation facilities; and

WHEREAS, The bill containing this amendment, S. 324, is pending before the United States Senate after having been passed by the Committee on Energy and Natural Resources, and the National Association of Regulatory Utility Commissioners (NARUC) has never taken an official position on this bill; and

WHEREAS, The majority of State utility commissions have taken steps to encourage utilities to pursue Least-Cost Planning and DSM strategies, and have in many instances incorporated Least Cost Utility Planning and Integrated Resource Planning into the State-ratemaking process; now, therefore, be it

RESOLVED, That the Executive Committee of the National Association of Regulatory Utility Commissioners (NARUC) assembled at its 1990 Summer Committee Meeting in Los Angeles, California, finds that the new ratemaking standard cited above should encourage but not restrict the States' ability to fashion appropriate incentive programs for DSM by electric utilities; and be it further

RESOLVED, That the Executive Committee of the NARUC supports rewarding DSM efforts by utilities, but the extent and form of such incentives should remain the province of State regulatory commissions.

Sponsored by the Committee on Electricity

Adopted July 25, 1990

Senator WIRTH. Linda has been very helpful. She is very good, and she has been very helpful. I appreciate her assistance on this and her perspective. I think this fits what the President was asking for the other night, and let us get on with it.

Thank you again, Mr. Secretary.

Senator Murkowski, thank you for your patience. I appreciate it.

Senator MURKOWSKI. Thank you, Mr. Chairman. You mentioned a button that was floating around.

Senator WIRTH. Oh, there it is. Can I get a copy of that?

Senator MURKOWSKI. I would be happy to not only give you a copy but to give you an original with the promise that you wear it on occasion.

Senator WIRTH. At my Halloween party I will put it right on.

[Laughter.]

Senator MURKOWSKI. Someone once said it is better to be ridiculed than ignored. If you wear it at a Halloween party, that is all right with me.

I would ask you, Mr. Moore, if you concur with the Department of Energy's report that a high estimate of ANWR proposed to be in the area of 9.2 billion barrels would indicate that the yield potential is within the realm of Prudhoe Bay and would increase domestic oil reserves at about one-third, which is, it is my understanding, the Department of Interior's projections.

Mr. MOORE. Senator, it has the potential. The number that Senator Wirth gave a moment ago of 1 in 5, as you know and I am sure as the Senator would agree, are excellent odds in the oil business; not bad odds, those are excellent odds.

Secondly, I spent time with Department of Interior officials before I went up there and I looked at it again while we were up there. If oil is there, it has the potential of being larger than Prudhoe Bay, the largest in the United States of America and a significant addition to our reserves, yes.

Senator MURKOWSKI. That 9.2 billion is the optimistic range. There is another estimate of a norm at 3.2, but even at 3.2 the Department of Interior states that that would be the third largest oil field ever found in the United States, next to East Texas and Prudhoe Bay.

Mr. MOORE. That is right.

Senator MURKOWSKI. Now, we often hear criticism that if ANWR is brought on line it only represents a 200-day supply, yet you and I know that Prudhoe Bay, the estimate there is that it is only a 600-day supply, yet that 4-foot pipeline has been producing 24 to 25 percent of the total crude oil produced in the United States for almost 20 years, and it has a life of another 20 years.

So my question to you, sir, is, how do we inform the public of the realities associated with the fact that that is an awful lot of oil as opposed to the rather flippant generalization that, well, it is only a 200-day supply, or it is only a 600-day supply, therefore it is of little or no consequence?

Mr. MOORE. Senator, that, indeed, is the test of how you can get the public's attention. I think maybe now, because of Iraq, the public is a little more attentive to this. I think with the hopes of the national energy strategy the public would be far more attentive to this.

I did not state the facts correctly a moment ago, and I would like to correct the record that while some would say ANWR might equal only 185 days of current U.S. consumption, another way of looking at it is, 80 percent of all the on-shore discoveries in the United States only equals 1 day. That sort of gives you an idea of the 80 times larger field that ANWR really is, but we are going to have to work at that, and have to work with the American people.

I think their basic concern is that, can we produce there safely? Are we going to be doing some kind of irreparable damage to the environment by going up there? When you answer those questions, then we can get around to the question of how many barrels we are talking about.

But I think the best way to put it is, it is believed this would be the biggest oil field ever in the history of the United States. That may be the way to have the American people look at it.

Senator MURKOWSKI. I appreciate those comments, and I appreciate your sensitivity. As you and I both know, things are a little different in Alaska. It is not good enough to just find oil. You had better find a lot of it, because the economics of bringing it to market simply dictate that reality.

Mr. MOORE. Well, there was a point that was made that I did not get a chance to address when Senator Wirth asked about the fact that, is this not a long term thing, that you bring ANWR—you drill at ANWR, and then if you find something you are looking at 10 years before you get anything out of it.

We believe that there are some fields that can be developed much quicker between Prudhoe Bay and ANWR that could be con-

nected into the lines and on stream sooner than the 10 years, and so there is additional production that would occur prior to 10 years for ANWR itself, just by the mere fact that you make it profitable once you go into ANWR to begin to develop the fields adjacent to it.

Senator MURKOWSKI. I think it is also appropriate for the record to note that much of the time anticipated is permitting time, and depending on the extent of the emergency——

Mr. MOORE. Senator, I will tell you—you know this, because you were the one who so graciously invited me and encouraged me to spend the week in Alaska that I did, but I would really encourage those that really want to spend some time on this issue to do a little research and if they can spend a little time going up there themselves.

There are certain times of the year when it is better to go than others, obviously, but the point I am making is that when you have been there, and when you have walked over it, and when you have looked at what the latest technology is, you come to the conclusion, as did the Fish & Wildlife people who accompanied me on the trip, that the danger is not to fish and wildlife. That is not the danger.

What they are arguing about is the aesthetics of mankind being there. I think we need to really study that issue very carefully and decide whether we are in a neopantheist society where man should just not be there, or whether we are really concerned about caribou and we are concerned about the flocks of wild geese, and we are concerned about the fish and the other ecosystems that exist there.

I do not think there is any question now, from what I have seen and heard while I was up there, that that can be protected. I think it is also important to note that everything that is there is to be removed when production is over, and some of the drilling islands are already being washed away by the tidal action and by the ice action. They are no longer in use, and equipment is being moved out already.

So I think that from the aesthetic point of view, one day it will be returned to exactly as it looks today, and that I think it is important that as we look at this debate that we really sit down and talk about the facts. What are we talking about, danger and damage to the wildlife? Or are we talking about the aesthetics of whether man ought to be there or not? I am beginning to think that debate falls into the latter half of that dichotomy instead of the former half.

Senator MURKOWSKI. I appreciate that sensitivity. How would you suggest we go about addressing the footprint associated with an ANWR exploration and potential development?

Because as you and I both know, the total acreage in the Arctic National Wildlife Refuge is 19 million acres. That is a significant piece of real estate, and you and I are both aware that out of that 19 million, 8 million acres have been set aside in perpetuity in a wilderness already.

We are also aware that out of the coastal plain there is 450,000 acres that are set aside in wilderness. We are talking about less than 8 percent of the area—1.5 million acres—to be determined by Congress as to whether or not they should allow exploration, and that is what we refer to as the ANWR issue.

So if you reflect on the percentage of the vast 19-million acre area, and argue that you are only talking about allowing exploration on 8 percent of the area, if we do find recoverable reserves the actual footprint will be about 12,500 acres. Now, that is about the size of a Texas farm.

I am told that in relationship to the land area of the State of Virginia, if you took the Dulles International Airport complex as the only activity in Virginia, it would be comparative to the 19 million acres and the 12,500 acres of actual footprint in the ANWR area.

So the problem we are having in educating the public is to try and keep these comparisons realistic and yet recognize that there is going to be a footprint, that we do have a genuine concern about the environment and the ecology and the porcupine caribou herd, but there is a new dimension in it now, because we have the factor of American lives in a foreign country, protecting against a foreign aggressor so that the western world can maintain a supply of foreign oil.

Mr. MOORE. Senator, I will go back and look at your figures. I am sure they are correct. You have been correct on everything else you have shown to us in the past concerning this.

But on that footprint, there are those that I heard from before I went that said, look carefully at Prudhoe Bay and look carefully at ANWR, and what you are going to see in ANWR is a reproduction of Prudhoe Bay.

That is an intellectually dishonest statement, because the technology in the early years of Prudhoe Bay required a much bigger footprint than the latest facilities, the Endicott facility, which is much smaller—as a matter of fact, 90 percent smaller—than the equivalent facilities built in the early years of Prudhoe Bay.

So the kind of technology that you would be seeing going into ANWR is a significantly smaller footprint in terms of a site upon which you drill and where you separate out the gas and you actually produce and pump the oil—a significantly smaller facility. 90 percent smaller.

These kinds of things ought to be built, perhaps, into the legislation to see to it that we do protect ANWR; we require the latest, best technology, we are concerned about the calving area, we do not do permanent damage; we do all the mitigating things we know will work from what we have seen in the Prudhoe Bay experience of 20 years with wildlife.

So I think that again what we are getting ourselves down to is aesthetics, and not really, can we do it and do it safely?

Senator MURKOWSKI. I appreciate you pointing out that observation. You point out the Endicott field which came on line a year ago last February, in association with Prudhoe Bay. When it came on line it was the 10th largest field in the United States. Today it is the seventh or eighth. It was producing 100,000 barrels a day. Today it has increased that to over 110,000 barrels a day.

The significance is that the footprint was 54 acres. That is the technology that is being utilized. So I would hope that we can communicate this reality that there are proportions and there is technology, and as a consequence, that footprint can be lessened. But we also have, of course, that dimension of our American military

troops overseas which I think makes it mandatory that Congress address the realities associated with our dependence on Mideast oil.

Let me defer briefly to another area that I think deserves some examination, and that is revenue potential. We are in a budget crisis. It is my understanding that the estimate of least sale bonus revenues, if ANWR is put up for sale, is in the area of \$3.1 billion in the first 5 years. And of course there is a sharing with the State of Alaska as well.

But obviously, you are looking at a significant revenue stream, and it is my understanding that the Department of Interior has estimated that the revenues over the life of the anticipated throughput of ANWR at 3.2 billion or 3.2 million barrels would bring in approximately \$79 billion in bonus, rent, royalties, taxes, and after tax profits. So is this an additional inducement, if you will, to address the merits of ANWR, or are you concerned with that?

Mr. MOORE. Certainly, it is.

Senator MURKOWSKI. In line with that and the reality that we are spending currently \$45 billion for imported oil, what is the administration's position about stimulating the domestic industry, bringing back our stripper wells, getting our production back up, recognizing that there is a concern over an economic downturn associated with our unfavorable balance of payments, our increased foreign debt, our increased domestic debt, how much of this is entering into the equation of decisions such as opening up ANWR and others, when you recognize that there is a revenue potential, a substantial revenue potential?

Mr. MOORE. Senator, what you heard the President say Tuesday night I think signaled what he is thinking when he talked in terms of let us talk about trying to pass legislation on ANWR. Let us see what we can do to protect the environment and do it in a responsible way. And at the same time, he talked about tax incentives that he has sent to the Congress a year ago and as yet there have not been, even any hearings in the Congress on those proposals that would stimulate production throughout the United States.

That is certainly one side of the equation and one that I hope the national energy strategy will convince you that is a very definite part of that equation, just as increased energy efficiency and renewable forms of energy are.

Senator MURKOWSKI. You do not have to convince me very strongly, that if you took a portion of the \$45 billion that you are expending for importing foreign oil into the United States and shot that into the domestic industry, the extension of not only the tax base, but the increase in jobs and productivity would have a tremendous economic impact on the vitality of our Nation. And I would hope that the Department of Energy is factoring that in as you reflect on the merits of making the tough decisions as to how you are going to prioritize the alternatives, whether it be incentives, whether it be opening up ANWR, whether it be in the area of energy savings alternatives as well.

You talked about gas, a gasoline tax. I am not speaking for, obviously, my other colleagues, but the Senator from Alaska would certainly oppose any gasoline tax that went into the general revenue stream. Now on the other hand, if there was a decision made to put on a modest gasoline tax to reduce the accumulated debt of this

Nation, that \$3.1 trillion, then you might get some support from the Senator from Alaska, because then you are reducing the carrying charge. You are reducing the interest cost of that \$3.1 trillion, and I think you are doing something positive that we are going to have to address in a meaningful way.

But to just throw it into the general fund, even though it may be billed as temporary, the reality is, once you get a source of revenue around here it becomes permanent. And so for whatever that observation is worth, I simply offer it. I think our structure has to be in the area of a user fee of that nature to reduce the overall accumulated debt of this country, that \$3.1 trillion.

Let me conclude by commenting very briefly on a couple of things. One, you indicated very firmly the commitment on ANWR to move within this session and it is evidenced in your statement that you prepared here, and I am most appreciative of that, you further indicated that there was going to be a number of people going up to Alaska to evaluate the permitting status of both the Niakuk and the Point McIntyre fields, which in your chart you indicated could contribute somewhere in the area of 100,000 barrels per day. What authority do you have, if any, to expedite in the interest of national energy security, an expeditious resolve of this permitting process? I recognize that in the case of States, why, you have limited control, but these are Federal agencies that, for various reasons, have not been able to get this permitting done. What authority do you have?

Mr. MOORE. Senator, we do not believe we have any. We think that it is very important for the Department of Energy not just to sit and do nothing because the law does not say, thou shalt do something. We believe it is incumbent upon us, when you have something like this, to see what it is we can do, and we have found in the Point Arguello situation that the parties were willing to have the Department of Energy enter in and act as an unofficial mediator and sit down and see what could be worked out.

Senator MURKOWSKI. That was State though, that is a State problem.

Mr. MOORE. That was State officials or county officials even.

Senator MURKOWSKI. Our problems are Federal problems.

Mr. MOORE. We would think that we would have an even better opportunity of bringing the Federal authorities to the table to also work with the State of Alaska and the individual companies involved to try to solve those issues as well.

Senator MURKOWSKI. Well we certainly hope you have better luck than our delegation has had, because as I have indicated, we have some agencies that are absolutely running amok and the Corps is one of them and so is the Environmental Protection Agency.

Mr. MOORE. I met with the Deputy Corps Engineer while I was up there and also the Deputy Regional Administrator while I was up there and we began our discussions.

Senator MURKOWSKI. Well, some of the professionals within those agencies seem to have their own agenda and sometimes that is a little difficult to counter, but nevertheless, we do appreciate the commitment you are making in sending your people up there be-

cause it is in the national energy security interest of our country and that is obviously most significant.

Let me conclude, and I really mean that this time, with a reference to a national energy policy. Senator Ford made reference to it. I have been around here only 10 years. I have seen proposals come and go, but it seems to me that unless you control the agenda, the best you can hope for is an energy policy full of addendums.

And when I say control the agenda, the fact that we are importing half our crude oil from the Mideast and the reality of the presence of Saddam Hussein, and what we have seen OPEC do, is to control the agenda on the available supply of crude oil in the world. And if you control the agenda on the available supply, in effect, you control the price. And as long as we are dependent for 50 percent of our imports from the Mideast, I do not see how, sir, how you are ever going to get an energy policy that is not anything but a series of addendums or what ifs. Because what if they reduce the supply? The price goes up. What if they make oil cheaper, alternative fuels, gasohol and so forth, phase out because of the economics?

I am not going to make a speech on the subject but I think it is fair to suggest in the broad term that when you address a resolve of an energy policy, you recognize the position you are in, and that is one of dependency. And unless we have a lesser degree of dependency and a greater degree of independence, we are not going to be able to control that agenda and we are going to see ourselves in the same situation as we were before.

Mr. MOORE. Senator, I would just suggest that probably you are correct but that changing that situation is not going to be something that happens overnight. It is going to be a long process of a number of actions that taken together will ultimately present a different picture than the one you portrayed. It will not be done overnight. There is no one silver bullet that is going to do it.

The whole point of the strategy is to present a number of actions that over time will get you to certain places; you can see where that is, and you may add to it or detract from it. That is what the options to be given to the Congress will do.

Senator MURKOWSKI. Sometimes we are our own worst enemy. I could not help but hear the remarks of my colleague from Hawaii with reference to the concern he had over the adequacy of either a crude oil supply or a refined supply for his State. Yet, the recognition that we have protective legislation that mandates that he can buy product cheaper from a foreign country in the sense that he can bring it in on a foreign vessel than he can buy it from the State of Alaska where Federal law mandates that it has to go on a U.S. tanker and therefore makes the cost higher—

The same is true in coal. Hawaii buys coal. They do not buy coal from Alaska because we have a Federal law that mandates that coal move in a U.S. flag vessel, which makes it uncompetitive with Australian coal. So sometimes we are our own worst enemy.

Mr. MOORE. No question of that.

Senator MURKOWSKI. I want to thank Patty for her patience and certainly the court reporter and you, Mr. Moore.

I think the hearing has been very beneficial, and I think it has covered a wide range of timely topics. It will be interesting to see where we go from here.

Good luck to you, Mr. Moore.

Mr. MOORE. Thank you, Senator.

[Whereupon, at 1:20 p.m., the hearing was adjourned.]



APPENDIX

RESPONSES TO ADDITIONAL QUESTIONS

DEPARTMENT OF ENERGY,
Washington, DC, December 7, 1990.

HON. J. BENNETT JOHNSTON,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: On September 13, 1990, Admiral James D. Watkins, Secretary of Energy, gave testimony on the Implications of the Middle Eastern Crisis for Near-Term and Mid-Term Oil Supply before your committee.

Following the hearing, you submitted written questions on behalf of yourself, Senator James A. McClure, Senator Jeff Bingaman and Senator Malcolm Wallop to be provided for the record. Enclosed are the answers to those questions.

If you have any questions, please have your staff call Barbara Barnes on (202) 586-6341. She will be happy to assist you.

Sincerely,

JACQUELINE KNOX BROWN,
*Assistant Secretary, Congressional
and Intergovernmental Affairs.*

[Enclosures.]

QUESTIONS FROM SENATOR J. BENNETT JOHNSTON

WORLD OIL SHORTFALL

Question 1(a). DOE estimates the gross world oil disruption due to loss of oil from Iraq and Kuwait to be 4.3 million barrels of oil per day.

What is your current estimate of the world oil shortfall caused by the Middle East crisis?

Answer. For the month of October, it is estimated that the shortfall averaged 1.1 million barrels per day. This estimate is based on the assumption that the average transit time is 30 days and therefore represents a net shortfall estimate on a delivered basis.

Question 1(b). What is the projected shortfall for the next twelve months?

Answer. By November, the shortfall is expected to be about 600,000 barrels per day and should be further reduced to 200,000 barrels per day by March 1991. This estimate is based on the assumption that the average transit time is 30 days and therefore represents a net shortfall estimate on a delivered basis.

Question 1(c). What effects will be felt by Americans as a result of the shortfall? When will these effects be felt?

Answer. American consumers will experience higher petroleum product prices as higher crude oil cost are passed through to the retail level. For example self-serve unleaded regular gasoline has increased over \$.25 per gallon at the retail level but does not yet fully reflect the increase in crude oil prices. It is also likely that increased energy cost will also be reflected in the prices of other consumer goods, travel, and services.

Question 1(d). What are your projections regarding crude oil prices over the next twelve months?

Answer. Due to the current instability of crude oil markets and uncertainty regarding future events, it is not possible to make precise projections of crude oil prices at this time.

The attached Short-Term Energy Outlook¹ examines the implications of three price levels, \$20, \$25 and \$30 per barrel.

Question 1(e). How long will it take to replace the entirety of the crude oil production shortfall caused by the Persian Gulf crisis?

Answer. It will probably take longer than the 12 months that we have examined. However, it would not be unreasonable to assume that worldwide production capacity could be expanded significantly over the next 2 or 3 years, and such increases would occur if prices remain high and a demand for the oil exists.

Question 2(a). Some observers believe that a lack of adequate refining capacity may lead to fuel shortages even if supplies of crude oil are adequate. What are your projections regarding possible shortages of refined products such as gasoline and fuel oil?

Answer. Refining capacity in both the United States and worldwide is tight, but should be sufficient unless the current situation in the Persian Gulf worsens. Absent major unforeseen refinery problems or unusually cold weather, shortfalls in refined products are not anticipated as a result of available refinery capacity. Motor gasoline stocks, as of October 12, 1990, are at average levels based on the past three years. The situation for the supply of distillate fuel oil is very encouraging. While demand has been close to year-earlier levels, stocks on October 12, 1990, of 187 million barrels are 14 million barrels higher than last year this time.

Question 2(b). What are your projections regarding gasoline and fuel oil prices over the next twelve months?

Answer. Because current crude oil markets are very volatile, EIA has examined three plausible crude oil price levels in its Short Term Energy Outlook (STEO). The three scenarios each include the assumption of constant crude oil prices (Composite Refiner Acquisition Costs) beginning September of 1990, with values of \$20, \$25, and \$30 respectively. This price range reflects substantial uncertainty about energy markets over the next several months.

Under the high case world crude oil price of \$30 per barrel, the average motor gasoline retail price for all grades and services is forecast to be \$1.39 per gallon this winter compared with last year's level of \$1.07. During the spring and summer of 1991, the price per gallon is forecast to rise further to an average of \$1.52, compared with \$1.19 during the same period of 1990.

For distillate heating oil, the retail price this winter is expected to average \$1.24 per gallon if the world price of crude oil is \$30 per barrel; last winter distillate heating oil prices to consumers averaged 99 cents per gallon. During the spring and summer of 1991, heating oil prices are expected to decline slightly to an average of \$1.22 per gallon, compared with an average of 91 cents per gallon during the same period of 1990.

Question 3(a). Saudi Arabia, Venezuela, and the United Arab Emirates have agreed to increase production. How long will it take for this production to come on-line?

Answer. Some of this production has already come on-line. Surge production from Saudi Arabia and several other countries in August was almost one million barrels per day over July levels. In October, we expect surge production to reach 3.7 million barrels per day, and that by November about 3.9 million barrels per day of production, over July levels, will come on-line. It may take several additional weeks for this production to reach end-use markets.

Question 3(b). What other countries are likely to increase production to make up for the shortfall?

Answer. While the bulk (over 50 percent) of increased production is expected to come from Saudi Arabia, other significant increases are expected to come from Iran, the United Arab Emirates, Venezuela, Nigeria, Libya, Algeria, the U.S. and the North Sea.

Question 3(c). What opportunities do you see for increased domestic production in the near-term and mid-term?

Answer. We expect production in December in the U.S. to be 220,000 barrels per day above July levels. This increased production can be sustained into the first quarter of 1991. However, for the year as a whole, 1991 production is expected to be slightly below 1990 production assuming oil prices remain above \$25 per barrel. This is in marked contrast to recent years when domestic production has shown significant decreases.

¹ Retained in committee files.

USE OF SPR TO DAMPEN PRICE SPIKES

Question 4. Under what circumstances, if any, would the Administration initiate a Strategic Petroleum Reserve drawdown to dampen the effects of rising crude oil prices?

Answer. The conditions under which the Strategic Petroleum Reserve (SPR) can be drawn down are stipulated in the authorizing legislation, the Energy Policy and Conservation Act (EPCA). For an SPR drawdown to occur, the President must make a finding that there is a "severe energy supply interruption," or that drawdown is necessary to meet U.S. obligations under the Agreement on an International Energy Program. The term "severe energy supply interruption" is defined as a national energy supply shortage which the President determines—

(A) is, or is likely to be, of significant scope or duration, and of an emergency nature;

(B) may cause major adverse impact on national safety or the national economy; and

(C) results, or is likely to result, from (i) an interruption in the supply of imported petroleum products, (ii) an interruption in the supply of domestic petroleum products, or (iii) sabotage or an act of God.

In addition, recent amendments to EPCA provide that a limited drawdown of the SPR is authorized if the President finds that—

(A) a circumstance exists that constitutes, or is likely to become, a domestic energy supply shortage of significant scope or duration; and

(B) the limited drawdown would assist directly and significantly in preventing or reducing the adverse impact of such shortage.

Therefore, the statute envisions the use of the SPR to mitigate energy supply shortages. While price dampening impacts of a drawdown may occur, they are not the primary purpose of a drawdown. Under statute, price increases in themselves are not a reason for releasing crude oil from the SPR.

The current supply situation is being monitored closely, as additional crude oil production comes on line from producing countries with spare production capacity, and the high worldwide stocks are drawn down to meet petroleum requirements. Should the situation warrant it, we are prepared to implement a coordinated drawdown of the more than 1 billion barrels in strategic stocks held by the United States and by other member countries of the International Energy Agency.

COORDINATION OF SPR DRAWDOWN WITH ALLIES

Question 5. What steps has DOE taken to coordinate a possible SPR drawdown with our allies that maintain their own strategic reserves?

Answer. Since its initial August 9 meeting on the current supply disruption, the IEA Governing Board has continued to believe that there is no need for recourse to IEA emergency systems at the present time. However, it has initiated intensive market monitoring and engaged in technical discussions in preparation for possible activation of response measures, in particular, coordinated stockdraw. These technical discussions have focused on clarifying members' stockdraw capabilities, legal authorities, operational procedures, and like matters. Resolving the issue of individual members' contributions to a coordinated stockdraw is a matter that would be taken up by the Governing Board if and when there is agreement that such action should be implemented.

PLANNING FOR AN SPR DRAWDOWN

Question 6-1. What steps has DOE taken to plan for the contingency of an SPR drawdown?

Answer. Since August 2, the Department has maintained the Strategic Petroleum Reserve (SPR) in a heightened state of readiness to drawdown and distribute its crude oil inventory. Preventive maintenance activities have been accelerated, detailed operational plans have been made, and a draft Notice of Sale has been developed. Should a drawdown of the SPR be directed by the President, the Reserve is prepared to immediately convert to a drawdown mode of operations and initiate a competitive sale of oil. Additionally, in order to demonstrate the SPR's ability to be drawn down and distributed, the Department commenced a test sale of 5 million barrels of SPR oil on September 28.

Question 6-2. How much time would elapse between a decision to draw down the reserve and the actual distribution of the crude oil?

Answer. A Notice of Sale would be issued to already identified prospective offerors within a day following a Presidential decision and the first contracts could be

awarded about 15 days later. Distribution of oil from the SPR terminals could then commence as soon as the purchasers made their pipeline and marine transportation arrangements, requiring about 1 to 2 weeks.

Question 6-3. How would the oil be distributed? Are you confident that the distribution network would work?

Answer. SPR crude oil would be distributed from SPR terminals by means of the commercial oil logistics system, involving pipelines, tankers and barges. Inasmuch as these modes of transportation are used on a daily basis by industry, the Department is highly confident that they will function as intended at the time of an SPR drawdown. The efficiency of this system currently is being demonstrated, on a limited basis, by the SPR's ongoing test drawdown and distribution.

OIL IMPORTS

Question 7. Given our increasing dependency on oil imports and the deployment of troops to the Persian Gulf, do you believe petroleum imports threaten to impair the national security?

Do you believe that the President should exercise his authority under section 232 of the Trade Expansion Act to adjust oil imports?

Answer. We are strongly opposed to any exercise of Section 232 authority to limit or reduce oil imports through government interventionist measures. The oil market today is a world market, and oil exporters and importers are interdependent. As a nation, we must recognize that imports per se do not threaten our energy security. Most of our oil imports are from reliable, stable areas and do not pose a threat to our security. The threat is the result of our dependence, and the dependence of our allies, on petroleum imports from potentially unreliable or unstable areas. Sharp worldwide declines in the availability of such imports cause significant price increases and, as a consequence, impose economic costs to the nation. Limiting imports will impose very high costs on the U.S. economy and, worse yet, it will not reduce our vulnerability to sharp price increases in the event of an interruption. For these important reasons, it makes no sense to limit or cap imports of petroleum by government edict. Instead, we should develop domestic resources and improve energy efficiency where it is economic to do so. We also should encourage the development of oil resources outside unstable geographic areas through effective trade and diplomatic initiatives.

In 1987 and 1988 the Department of Commerce, as required under law when formally requested by an outside party, investigated whether oil imports under Section 232 of the Trade Expansion Act threatened to impair our national security. As reported, the investigation concluded that such imports did threaten U.S. security, consistent with the numerous investigations of this subject over the past 20-plus years. However, in 1988, the Secretary of Commerce determined that actions to adjust oil imports were not appropriate and would impair rather than enhance national security. President Reagan concurred with the Secretary's recommendation.

Question 8. How long will it take for existing commercial crude oil stocks to be drawn down and what are the likely consequences when this happens?

Answer. Since July 31, 1990, commercial stocks of crude oil have decreased by about 29 million barrels. The stock level of 350.4 million barrels in early November 1990 was about 14 million barrels above the level 1 year ago and about 50 million barrels above the minimum operating inventory level. The minimum operating inventory level is the volume of stocks necessary to maintain normal operations. It includes "unavailable" stocks such as pipeline fill and "required working" stocks such as those in refinery tanks and processing equipment. If stocks fall below the minimum operating inventory level, operating problems and shortages would begin to appear.

In early November 1990, the rate of consumption of crude oil as refinery input was about 500,000 barrels per day or 4 percent lower than 1 year ago because of decreased demand for petroleum products. At this rate of consumption, crude oil stocks above the minimum operating inventory level represent about 4 days of refinery inputs, a normal situation. Domestic production of crude oil was averaging about 7.3 million barrels per day and net imports of crude oil were 4.9 million barrels per day, levels which provided about 95 percent of domestic crude oil requirements. Inventory drawdowns provide the balance of requirements. In addition, net imports of petroleum products averaged about 1.0 million barrels per day.

While we do not anticipate problems with crude oil supplies, we are closely monitoring supply conditions and are working with our partners in the International Energy Agency. If future circumstances warrant, we are fully prepared to take fur-

ther measures, including a coordinated drawdown of strategic stocks. The U.S. currently has about 600 million barrels in its Strategic Petroleum Reserve.

COMMERCIAL STOCKS

Question 8(b). What is the extent of current worldwide commercial stocks?

Answer. There is no current data on worldwide commercial stocks; however, we have estimated that free world stocks at the end of the second quarter of 1990 were about 4.7 billion barrels, some 430 million barrels above normal levels for this time of year.

ENFORCEABILITY FUEL SWITCHING

Question 9. Is there any way to enforce fuel switching? For example, if the Persian Gulf crisis ended tomorrow and oil prices returned to their pre-invasion levels, what would prevent facilities with fuel switching capability from returning to oil?

Answer. Section 404 of the Powerplant and Industrial Fuel Use Act of 1978 (FUA), gives the President the authority to prohibit the use of oil and/or natural gas in electric powerplants or major fuel burning installations upon the President's declaration of a severe energy supply interruption. Such a prohibition by the President is limited to the duration of the declared interruption or 90 days, whichever is less. Extensions of such prohibitions are possible after transmittal to Congress in accordance with section 551 of the Energy Policy and Conservation Act. However, there should be no need to pursue enforcement of fuel switching. Market forces will cause facilities with fuel switching capability to use the most economical fuel available as long as all other factors, such as availability of transportation, are equal. Furthermore, several of the short-term and mid-term measures announced in response to the Iraqi invasion and several options under review in the National Energy Strategy are designed to further eliminate barriers to making market-based decisions.

Question 10. What would be the options if there were a major unscheduled outage of refinery capacity?

Answer. Refinery capacity utilization was about 84 percent in early November. Although this figure has fallen recently due partially to scheduled maintenance, the overall utilization rate is low enough to provide a significant cushion against unscheduled outages in the coming weeks. A relatively cold winter could drive the utilization rate upward. Any unscheduled refinery outages would be met by a combination of increases in the utilization rates of unaffected refineries, changes in refinery output slates and higher volumes of petroleum product imports. Such an adaptation may be easier in the heating season than during the high gasoline demand season. During the winter, U.S. refineries usually run at utilization rates several percentage points lower than in the summer months. Last winter, for example, refinery utilization was about 86% of operable capacity in October and November. In January and February of 1990, due to a perceived shortage of heating fuels, utilization jumped to almost 88%.

Inasmuch as the largest U.S. refinery represents only about 3 percent of total U.S. refining capacity, accidents that would shut down more than that amount of U.S. product supply should be viewed as unlikely. Even then, markets can often accommodate the loss. In May, 1988, for example, Shell's Norco, Louisiana refinery was shutdown due to a major explosion. Most of the refinery stayed out of operation for the remainder of the year thereby eliminating about 2 percent of U.S. refinery gasoline production. Prices rose relatively quickly, but other suppliers adjusted to the loss and there was no shortage.

Question 11. During the 1980's over 100 domestic refineries were shut down and 2 million barrels per day of refinery capacity was lost. How much of this refinery capacity could be brought back on line if needed and how quickly could this be done?

Answer. EIA estimates that approximately 0.7 million barrels per day (MMBD) of the 2.4 MMBD of crude oil capacity that was shut down since 1980 was mothballed (capable of being reactivated). The time frame for reactivating mothballed refineries is 3 to 18 months. However, local, State, and Federal licensing could take up to 2 years.

The operable crude oil capacity utilization rate was about 84 percent in early November 1990, down from the 92-93 percent range achieved in September 1990, indicating some additional crude oil capacity is available at operating refineries.

Refineries that shut down during the 1980's were typically small, independent facilities with less than 30,000 barrels per day of crude oil capacity and no downstream processing capacity. To the extent that some of these refineries were inefficient or obsolete, their shutdown was economically inevitable. Downstream process-

ing capacity has increased during this period by over 1.7 MMBD, resulting in an increased ability to produce more light product per barrel of throughput.

Question 12. The United States imports 2.3 million barrels per day of refined products, approximately 13 percent of our total demand. DOE has testified that during the 4th quarter of this year excess refinery capacity worldwide will be down to about 2.2 percent. Isn't this cause for concern?

Answer. We do not believe there is cause for concern at the present time. Gasoline stocks are climbing back to the levels seen at this time last year and, distillate fuel also has risen to more than 10 million barrels higher than last year. Refineries in the United States are now conducting their seasonal "turn-arounds," and utilization has fallen about 10 percentage points from the summer high points. After this maintenance is accomplished, utilization will rise somewhat, but is unlikely to be as high as in the summer months.

EIA's latest (October 25, 1990) "Fourth Quarter Overview of Petroleum Supply and Markets" projects that petroleum product demand in the market economies will be 53.2 million barrels per day (mmb/d). Of that amount, 5.5 mmb/d will come from stock drawdown, imports from the countries with centrally planned economies, and refinery gain. The remaining 47.7 mmb/d must be produced by refineries whose input capacities total 55 mmb/d.

This suggests refinery utilization rates of about 87 percent of available capacity. This utilization rate is high, but is thought to be achievable barring any major refinery accidents or other unforeseen incidents.

CLEAN AIR ACT REQUIREMENTS

Question 13. Under the pending Clean Air Act Amendments domestic refiners could be required to produce reformulated gasoline and refinery modifications in nonattainment areas could be more difficult than under existing law.

How will this affect the ability of domestic refiners to keep pace with the demand for petroleum products?

Will the end result be that more of our refined product requirements will be met from overseas?

Answer. The Clean Air Act bills require that emissions from gasoline sold in attainment areas not increase, while refiners produce gasoline to meet the requirements applicable in nonattainment areas. This will adversely affect the ability of domestic refiners to keep pace with the demand for petroleum products because it would effectively freeze gasoline composition. Almost any change to gasoline would increase emissions of some component, even though total emissions would be the same or less. Indeed, this requirement could inhibit changes to gasoline that would improve the environment. For example, this restriction could preclude the increased use of MTBE, or other oxygenates, because of higher NO_x emissions associated with additional use of oxygenates.

Gasoline formulation is highly variable and reflects availability and prices of feedstocks, and various conditions within the refinery. As particular units (e.g. crackers, alkylation, etc.) are taken out of service for periodic maintenance, changes to gasoline formulation are required to maintain refinery through-put. We need to insure that environmental regulations do not inhibit the refineries' capability to respond to changing conditions.

In addition to the "no increase" requirement, we are concerned that refineries in nonattainment areas will find it difficult to secure the permits and offsets necessary for reconfiguration to produce reformulated gasoline, given the requirements in the Title I agreement reached by the conferees. Toxic air emissions regulation will also require substantial capital investment by refineries and could result in the closure of some capacity. Finally, permitting and enforcement obligations could further reduce refinery flexibility.

The National Petroleum Council is evaluating these and other refinery issues for the Department of Energy. Until that evaluation is more complete, we cannot say with any degree of certainty what the effect of the Clean Air Act amendments on product imports will be.

ENERGY EFFICIENCY MEASURES

Question 14(a). Six of the nine medium term energy efficiency measures mentioned in your testimony relate to motor vehicles and can be classified as "better driving habits." These six measures account for 400,000 barrels per day of the 530,000 barrels per day of energy savings that the Department estimates could be saved by the nine efficiency measures. The six measures could appear to be totally voluntary.

How can the success of such voluntary energy efficiency measures be ensured?

Answer. Success can not be ensured but can be fostered by providing the public with information that will encourage a change in behavior. The Department's public awareness campaign will give consumers tips on relatively cost-free ways they can reduce their consumption of gasoline. The potential savings estimates do not hinge on 100 percent adoption of these steps by the public.

Question 14(b). Can such efficiency measures be enforced if necessary?

Answer. There would not be an easy or acceptable way to enforce the adoption of these efficiency measures by the public.

NATURAL GAS PIPELINE PROJECTS

Question 15. In your testimony you stated that there are 37 natural gas pipeline projects that could be expedited and that could displace oil. You indicated that the Department of Energy will work with the Federal Energy Regulatory Commission to develop procedures to expedite these projects and intends to develop legislative proposals to remove barriers to the certification and construction of natural gas pipeline projects.

Please identify the 37 pipeline projects, the status of such projects in the regulatory process, and the obstacles to issuance of the regulatory approvals that are prerequisites to the construction of such projects.

What are the procedures that you intend to develop with the FERC to expedite the processing of natural gas pipeline projects?

What can be done to expedite the permitting procedures of agencies such as the Department of the Interior and the Corps of Engineers that have responsibility for the issuance of rights-of-way for pipeline projects that must cross federal lands and navigable waters?

What are the legislative proposals that the Department is considering and when does the Department expect to transmit them to the Congress?

Answer. At this point in time, we are still in the preliminary stages of reviewing these projects. This includes an analysis of the roadblocks to action, as well as an assessment of those which will be of immediate benefit, i.e., can be constructed in the near term and will back out a demonstrable quantity of fuel oil, which in the Northeast U.S. is almost all imported. Thus, it is too early in this process to identify for the Committee the status and the obstacles to approval of these applications. Furthermore, the FERC prepared and provided this list of projects to us with the request that it not be publicized because its disclosure would result in pressure being placed upon the FERC by those who didn't achieve priority status. FERC has declined to release the list for this reason as well as the potential charge that certain projects have been prejudged. The purpose of my testimony on this point was to alert the Committee to initiatives under way, not to focus attention on particular projects or proceedings.

With the FERC, we are assessing opportunities where both their published and internal practices and procedures might be expedited. This includes more timely completion by all parties—FERC, applicants, and external agencies—of the required compliance with the National Environmental Policy Act (NEPA). In addition, the Department is reviewing and expects to comment on the Proposed Rule published by FERC on August 2, 1990 (FERC Docket Nos. RM90-1). This Proposed Rulemaking appears to offer an opportunity for FERC to expedite review of pipeline certificate applications, and we welcome FERC's initiative in this area. The Department's comments on this rule may include suggestions for additional revisions as well.

On the third subpart of your question, other federal agencies have indicated to us they will act expeditiously to process permits and other authorizations necessary for natural gas pipelines. In most cases, the statutory and regulatory requirements can be met more quickly than in the past through more efficient use of personnel and more stringent scheduling. In addition, agencies can coordinate their activities to avoid duplication and delays, and should be more responsive to FERC deadlines for completion of comments.

Finally, the Department is leaving open the possibility of a legislative initiative in this area if, after completing a review of all the proposals discussed above, we conclude that there remains unwarranted delay in the process which can only be overcome by statutory change. The Department is considering statutory proposals that were suggested by parties submitting comments for the National Energy Strategy. At this time, however, the Administration has not approved any specific legislative proposals, nor a projected date for submitting any such proposal.

CONVERSION OF FEDERAL FLEETS TO ALTERNATE FUELS

Question 16(a). In your testimony you indicated that the Federal Government would accelerate its purchase of and conversion to alternate fuel vehicles but did not specify any schedule for this conversion.

During 1991 and in subsequent years what percentage of the 55,000 vehicles per year purchased by the Federal Government will be alternate fuel vehicles?

Answer. For FY 1991 under the Alternative Motor Fuels Act (AMFA), funding of \$2,000,000 is expected for alternative fuel light-duty vehicles. The program cost of these vehicles is the incremental cost to GSA above that of a standard gasoline vehicle purchase. On the basis of our FY 1990 procurement, we expect this incremental cost to range from \$2,500 to \$5,000 because of the limited choice of models available as alternative fuel vehicles. Based on the available FY 1991 funds, the number of alternative fuel vehicles added to the AMFA demonstration fleet next year would be between 400 and 800, or about 0.7 to 1.4 percent of the 55,000 Federal vehicles purchased per year. In subsequent years, as the incremental cost of alternative fuel vehicles declines, we expect the number of vehicles acquired to reach 2,000 to 5,000.

Question 16(b). How will the schedule for phasing alternate fuel vehicles into the Federal fleet compare to the schedule for Federal fleet purchases specified in the pending Clean Air Act amendments?

Answer. Increased use of alternative fuel vehicles in the Federal Fleet will occur well before the schedule contained in either the House or Senate Clean Air bills. The CAA requirements would only affect the Federal Fleet in 1995, while the Administration's alternative fuels initiatives are already underway.

Question 16(c). What will be the criteria for selecting among the several alternate fuels?

Answer. It is our intent in the Alternative Motor Fuels Act (AMFA) demonstration program to maintain a "level playing field" with respect to the alternative fuels being examined, and we will include ethanol, methanol, and natural gas. Factors affecting decisions in timing and selection of vehicle/fuel combinations will include requests from user sites, availability of vehicles and engines from manufacturers, fuel availability and pricing, fuel delivery infrastructure availability, and environmental issues.

Question 16(d). In order to avoid merely trading dependency on one imported fuel for another, will the source of an alternate fuel be a priority in selecting the alternate fuels to be used in Federal vehicles?

Answer. No. The language in the Alternative Motor Fuels Act (AMFA) is specific and requires demonstration of natural gas and alcohol fueled vehicles in the Federal fleet without regard to the source of the fuel.

The objectives of AMFA center on the acquisition of performance, emissions, and cost data of the various engine/fuel combinations so that effective decisions can be made by producers and users of alternative fueled vehicles.

SUBSTITUTION OF NATURAL GAS FOR OIL

Question 17. The Department has indicated that within six months the United States could displace between 426,000 and 487,000 barrels per day of petroleum by means of fuels switching and that additional fuel switching could occur if the approval of pending natural gas pipeline projects could be expedited.

Did the Department in calculating the potential for fuel switching from oil to natural gas account for the fact that: (a) much of this fuel switching likely had already occurred because on an energy equivalent basis natural gas sells at a discount to oil; and (b) during the winter heating season pipeline capacity constraints would cause some portion of the fuel switchable gas load to be interrupted? In view of these constraints, how much imported oil can really be displaced by fuel switching?

Did the Department in calculating the potential for fuel switching from oil to natural gas determine the nature of the petroleum products that could be displaced? How much of the displaced product will be distillate and how much will be residual fuel oil? What are the alternate uses for the displaced residual fuel oil? What are the chances of an oversupply of displaced residual fuel oil and if this occurs, will it force refineries to cut back on runs of gasoline and distillate?

Answer. The estimates of switching available in the first quarter of 1991 were 178-239 thousand barrels in industry, 105 thousand barrels in residential and commercial buildings, 109 thousand barrels in utilities and 34 thousand barrels in transportation. The buildings and utility components are specific to winter and reflect switching to natural gas, propane or wood. The transportation component reflects increased use of alcohol additives. The industrial estimates are not specific to winter.

We estimate that most of the industrial switching away from fuel oil has already occurred in the third quarter since on a Btu basis, gas prices to industry are lower than fuel oil prices.

Normally, since they are low priority users, industrial users will switch back to fuel oil in winter as gas becomes unavailable. Should an emergency arise and should gas be made available by various means then this switching from oil to natural gas would be possible. However if natural gas remains plentiful because the winter is mild, then these users will most likely remain with natural gas.

We do not have the means of estimating the degree to which pipeline capacity constraints would cause an interruption in natural gas deliveries. Even if we had, this calculation depends critically on actual gas storage levels which in turn depend upon the preceding and actual weather.

In the 1985 Manufacturing Energy Consumption Survey Supplement on Fuel Switching, it was noted that in the manufacturing sector 30 percent of the switchable consumption was distillate and 70 percent was residual fuel. In the residential and commercial sectors the fuel split was 60 percent distillate and 30 percent LPG, with the remainder being residual fuel. In the utility sector the entire amount is residual fuel. Applying these percentages to the current estimates puts distillate fuel oil in the range of 116,000-135,000 barrels per day, and residual fuel oil at 240,000-282,000 barrels per day.

If natural gas were cheap and fuel oil were expensive then there could be a surplus of fuel oil. This could only happen if the demand for natural gas is low such as would occur in a warm winter. More likely in a normal winter with a surplus of fuel oil, the price of fuel oil would fall to become competitive with natural gas and the consumption of fuel oil would increase.

If fuel oil (either distillate or residual) is abundant and natural gas supply is limited, then the use of fuel oil by industry or utilities should present no problem.

Question 18. It has been suggested that there may be problems associated with the inferior quality of the crude oil that will replace the production lost from Iraq and Kuwait. Some have stated that the replacement oil is likely to produce about 8.5 percent less gasoline and heating oil per barrel of crude oil input and that an additional 500,000 barrels per day of crude oil is needed to make up the shortfall created by the embargoed Iraqi and Kuwaiti crude oil and refined product. Also, it has been reported that the refinery capacity that will make up for the loss of Kuwait's export plants is less sophisticated.

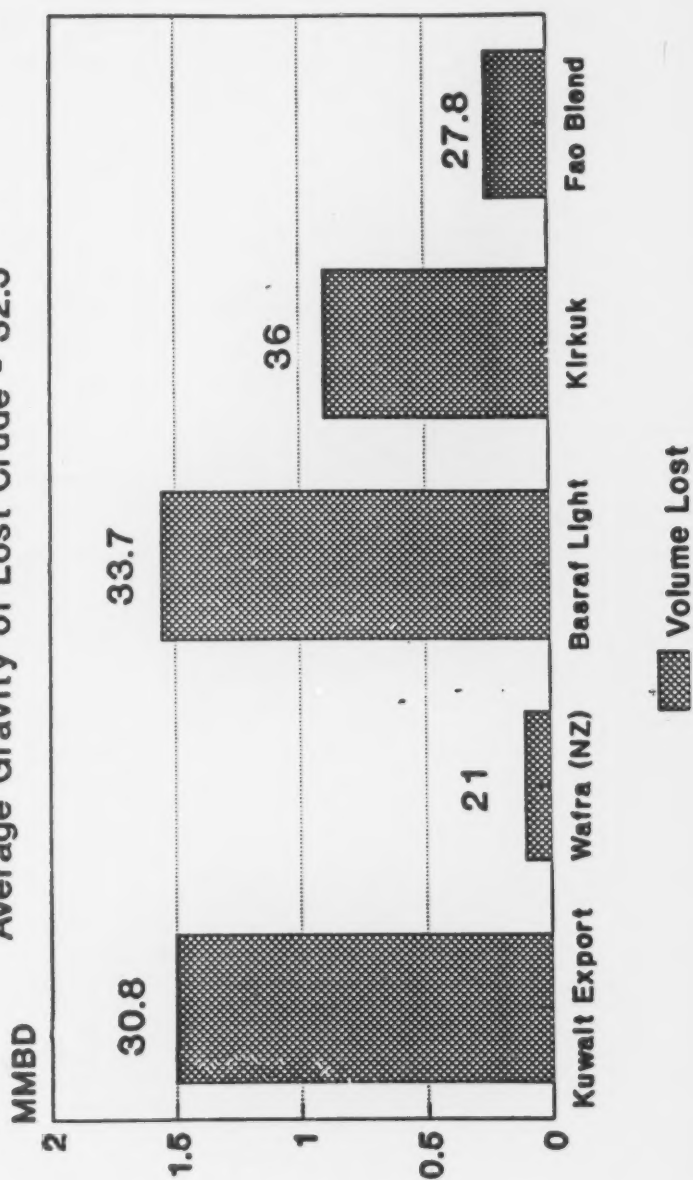
What is the Department's understanding of the effect that the quality of the replacement crude oil and refining capacity will have on the slate of refined products?

Answer. Charts showing the quality of the oil production that was lost and the quality of likely replacement oils are attached. These figures (which are subject to change) suggest that the replacement oils will be slightly heavier, by but 2° API gravity, than the lost crude oil. While this will produce somewhat less gasoline and other light products, this should not cause a major problem barring unforeseen events.

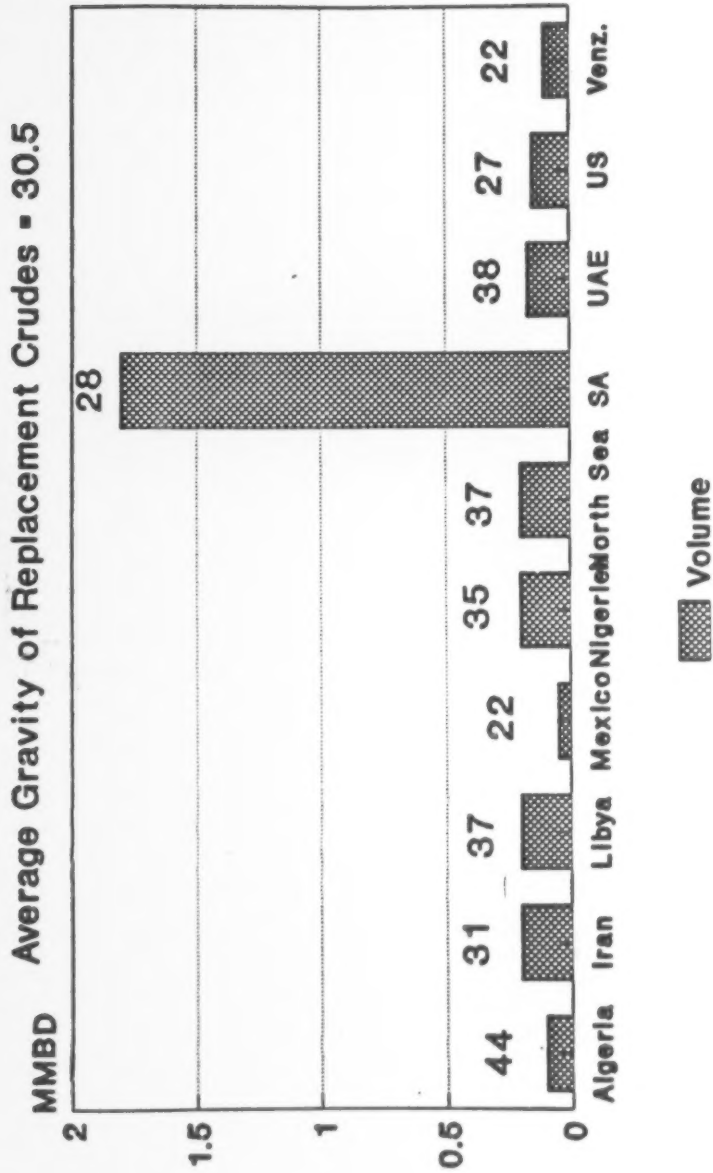
An estimate of free world oil refining capacity is presented in the attached table. These data show capacity in excess of projected demand by 1.2 million barrels per day in 4Q 1990. This excess capacity is enough to deal with a normal winter, however, colder weather or large unexpected refinery outages or other related events could cause problems in this area.

Lost Crude Oil Production (MMBD)

Average Gravity of Lost Crude = 32.5



Expected Production Gains MMBD



Estimated 4Q 1990 Market Economies Demand
and Refining Capacity*
(MMBD)

Total Refining Capacity in the Market Economies	55.5
Less United States	15.5
Less Kuwait	0.8
Plus Excess Refining Capacity in Eastern Europe	0.3
 Equals Total Non-U.S. Refining Capacity	 39.5
 Available U.S. Refining Capacity (92 percent of total capacity)	 14.3
Plus Available Non-U.S. Refining Capacity (90 percent of total capacity)	35.5
 Equals Refining Capacity Available to the Market Economies	 49.8
Plus NGL Output	3.5
Plus Refinery Gain	1.1
 Equals Refined Product Production Capacity Available to the Market Economies (A)	 54.4
4Q 1990 Market Economies Demand	54.1
Less Product Stock Withdrawn	0.4
Less Net Product Imports from Other Centrally Planned Economies	0.5
 Equals Net 4Q 1990 Market Economies Demand (B)	 53.2
 Total Excess Refining Capacity Available to the Market Economies ((A) minus (B))	 1.2

*All projections are rough estimates.

Estimates by Energy Information Administration
September 14, 1990

Question 19(a). There have been reports that during August and September United States exports of gasoline to markets in Europe have doubled or tripled their rates in recent years. Please explain this situation and what it means for American motorists in terms of the adequacy of gasoline supplies and the price that they will have to pay for gasoline.

Answer. The September 24, 1990, edition of *Oil Marketing Bulletin* stated "Estimates based on ship's charters are that more than twenty cargoes, representing about 7 million barrels of gasoline have moved or are earmarked for foreign destinations." Assuming the time reference of these exports is since the invasion and includes an estimate of none month for the "earmarked" portion (August 2 through October 31 or 90 days), the 7 million barrels equates to 77,000 barrels per day. Although this is large relative to previous motor gasoline export series, it is not significantly higher than the 58,000 barrels per day average exports during June, July, and August 1989. Responses from 5 of the companies mentioned in the article have not substantiated the newspaper claims.

There is no current shortage of gasoline. On September 21, gasoline stocks were at the highest level since April of this year.

ISING GASOLINE EXPORTS

Question 19(b). If necessary, what authority does the federal government have to regulate exports of gasoline?

Answer. Section 103(a) of the Energy Policy and Conservation Act, 42 U.S.C. 6212(a), empowers the President to restrict exports of petroleum products, "under such terms and conditions as he determines to be appropriate and necessary to carry out the purposes of this Act." In addition, sections 7(a) and (e) of the Export Administration Act of 1979, 50 U.S.C. app. 2406(a), (e), permit the President to prohibit or restrict the export of petroleum products where necessary to protect the domestic economy from the excessive drain of scarce materials and to reduce the serious inflationary impact of foreign demand. The responsibility for exercising these authorities has been delegated to the Secretary of Commerce.

It should be noted in this connection that under Article 904 of the United States-Canada Free-Trade Agreement, neither country may introduce a restriction on exports of an energy good to the other country for reasons of "short supply," unless:

(a) the restriction does not reduce the proportion of the total export shipments of a specific energy good made available to the other Party relative to the total supply of that good of the Party maintaining the restriction as compared to the proportion prevailing in the most recent 36-month period for which data are available prior to the imposition of the measure, or in such other representative period on which the Parties may agree; [and] . . .

(c) the restriction does not require the disruption of normal channels of supply to the other Party or normal proportions among specific energy goods supplied to the other Party such as, for example, between crude oil and refined products and among different categories of crude oil and of refined products.

QUESTION FROM SENATOR JAMES A. MCCLURE

Question. Your testimony (page 7 of your written statement and page 5 of the attachment to the written statement) states that the Department is undertaking a number of measures to help promote energy production. For each of these items please provide the Committee with a detailed description as to what is being proposed, how it will be implemented, whether or not it will require legislation and when the energy production response can be expected.

Answer. The medium-term initiatives intended to increase domestic oil production are as follows:

Expedited Action on Alaska Oil Project.—A number of oil discoveries in Alaska are not being developed due to difficulties in obtaining permits from Federal agencies. A multi-agency task force would identify those projects that would most benefit from expedited processing of the necessary Federal permits. Efforts would be undertaken to expedite the permitting of those projects. At this time, we do not expect that legislative action would be required. If all permits were issued for two major fields, Niakuk and Point McIntyre, they could be developed and on line in 36-48 months, contributing up to 100,000 b/d.

Increasing California Heavy Oil Production.—In certain heavy oil fields in California, natural gas is required for steam generation in order to increase production. Several major gas pipeline projects, primarily designed for this purpose, have been pending for a number of years. The pipelines cannot operate, however, until final

permitting difficulties are resolved. DOE and FERC would work with relevant Federal and State authorities to resolve the regulatory barriers preventing certification of the pipelines. Legislation most likely would not be required. Additional natural gas supply could be available within 12-18 months, which could increase California heavy oil production from 50,000 to 100,000 B/D in one or two years.

Facilitating construction of natural gas pipelines.—In a number of areas in the United States, natural gas pipeline capacity is not sufficient to satisfy the increased demand that would result from switching to natural gas from oil in dual-fuel facilities. DOE would work with FERC and other agencies to identify those natural gas pipeline projects that are now being delayed by the Federal regulatory process, and efforts would be undertaken to remove impediments and expedite the process. Pending a detailed study of environmental reviews and other causes for delays, it has not been determined whether legislation would be required. Portions of 16 major projects have the potential to displace a substantial volume of fuel oil during the next several years.

QUESTION FROM SENATOR JEFF BINGAMAN

Question 1. All of us have observed the tremendous volatility of oil prices since the first of August. Could you please outline for the Committee the role of the futures market in determining oil prices.

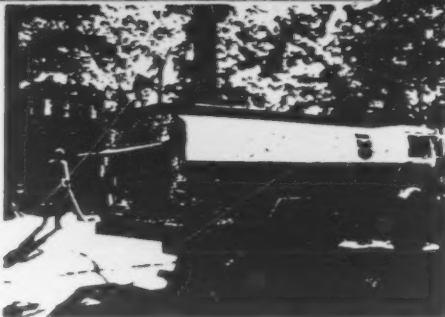
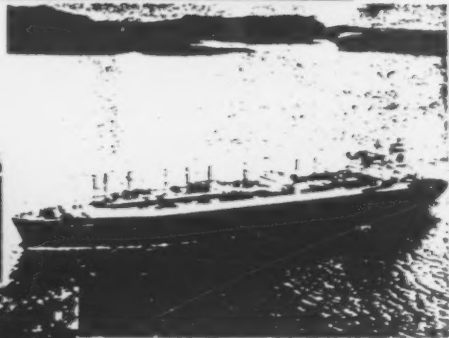
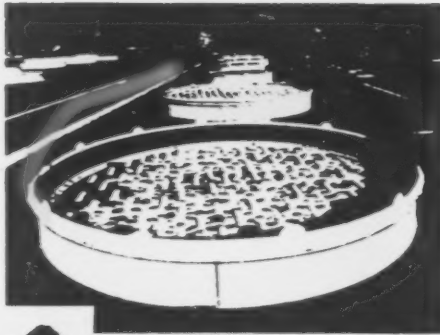
Answer. The use of long-term contracts in the oil industry ended in the late 1970s. In its place an active spot market and futures market for crude oil and petroleum products arose. Like futures markets for other commodities, the oil futures market trades future contracts, obligations to buy or sell fixed quantities of specified crude or product at a pre-defined time and place, under rules set up by the exchange where the trading is occurring (e.g., New York Mercantile Exchange [NYMEX], London's International Petroleum Exchange [IPE]). The trading process determines the price of the obligation. The price that is agreed to for out-month contracts reflects buyers' and sellers' current beliefs about the future prices of crude and products as well as their individual needs. Pages 3 through 7 of the enclosed study by the Energy Information Administration "Futures Markets and Petroleum Supply" describe the mechanics and the benefits/costs of the oil futures market.

DOE/EIA-0486

Futures Markets and Petroleum Supply

Energy Information Administration
Washington, DC 20585

A Study of Heating Oil Futures



2. Background

What Is a Futures Contract?

A futures contract is a contract for the delivery of a specified quantity of a commodity on a specified date in the future at a price that is agreed upon when the contract sale is executed. The quality of product and the delivery points that will satisfy the contract are also indicated.

In contrast to more common contractual arrangements, in futures markets the contracting parties need never meet one another nor, indeed, even know who their counterparts are. Further—and this is really the most important feature of futures trading—these standardized contracts may be sold and resold many times before the specified delivery date. Thus, a futures contract has a market value that may differ from the delivery price specified in the initial contract sale.

But, because the commodity to be delivered under the terms of the futures contract may be bought or sold in the cash market, the market value of a futures contract must ultimately reflect this cash price. The traded price of a futures contract should converge toward the going cash market price as the specified delivery date for that contract draws near.

How Are Futures Traded?

Futures contracts are traded on commodities futures exchanges, which are nonprofit corporations designated as futures contract markets by the Commodity Futures Trading Commission, a regulatory body of the Federal Government. Orders to buy or sell futures are executed on behalf of individual traders by brokers who are members of the exchanges. A smaller set of clearing members is legally positioned between traders—directly selling contracts to all buyers and buying from all sellers. The exchange sees to it that a clearinghouse function is provided to account for all contracts traded on the exchange and to ensure that they are settled. The exchange also sets the rules and supervises the conduct of trade and provides information processing and dissemination services.

While trading strategies can become very complex, there are only two basic futures transactions: a trader may go long or go short. A futures trader is said to be taking a long position in the futures market when he purchases a futures contract and thereby obligates himself to accept delivery of a commodity at a future time, at a designated place, and at a specified price. Conversely, a short position is taken when a participant sells a futures contract and thereby commits himself to deliver a commodity at a specified time, place, and price.

In spite of this commitment to accept or make delivery of the traded commodity, most traders close out their futures position by reselling a contract held or by buying a contract to offset a short position. Only a small percentage of trades result in physical deliveries. The ability to avoid dealing with the physical commodity, however, extends the usefulness and efficiency of the futures market for all classes of futures traders—as explained below.

Why Do Oil Firms Trade In Futures?

Public institutions, private companies, and individuals may use futures to hedge against market uncertainty or to speculate on expected price trends. In the petroleum industry, trade publications indicate that smaller, regional product marketers are very active in futures trading, while larger, integrated refiners are peripherally involved.

From the small amount of public information available on futures market activity, it is not possible to tell exactly which businesses are participating or, for those that do participate, what their goals are—whether hedging or speculating. Because the focus of this study is on the relationship between futures and cash market activity, more attention will be paid here to the hedging incentives of traders. The following chapters will discuss in more detail how oil firms may integrate futures trading with their normal business activities in order to reduce risk.

A futures trader is said to be engaged in hedging to the degree that the trader's futures position covers (or

protects) a present position (or commitment) in the cash market. This cash market position reflects the ownership of or commitment to produce, store, buy, or sell a physical volume of a specified commodity, either at the present time or in the future.

The value of this cash market position is at risk whenever the price of the commodity is subject to change or whenever the trader's future access to the commodity or ability to resell the commodity is not certain.

Futures contracts are a straightforward means for reducing supply or demand uncertainty—the contract guarantees the delivery or acceptance of delivery for a certain volume on a certain date. To reduce price uncertainty, a short hedger sells a futures contract to lock in the revenues he will receive either for his inventories or for his planned future production, while a long hedger buys a futures contract to lock in his future product costs.

The usefulness of futures for reducing price uncertainty is based on the economic relationship between a trader's cash market and futures market positions. The value of a firm's cash market position should change over time by an amount equal to but opposite that of an appropriate futures position. Take as an example a consumer who knows he must acquire a certain volume of heating oil in three months and buys a futures contract maturing on that date in order to hedge his position. If oil prices rise, he will have to pay more for oil in the cash market, but at the same time the value of his futures contract will increase by a comparable amount.

The net gain from a successful hedging operation should be zero—the trader neither loses nor profits from any change in cash market prices. Thus, hedging in futures enables participants to plan and budget more accurately for their future operations—a benefit equally as important as the ability to avoid major, unexpected losses.

How Can Futures Market Activity Affect the Cash Market?

Two frequent and, from the standpoint of the futures/cash market relationship, seemingly contradictory observations on futures activity relate to (1) the very high level of open interest (the volume of petroleum products represented by the total number of contracts traded) and (2) the small volume of contracts that are actually held to maturity and result in any delivery of the physical product. As a consequence of these observations, futures markets have been described as places where sellers do not have what they sell, and buyers do not want what they buy.

To many analysts, the high open interest represents the sum of potential claims on the cash market, which, if called, could significantly affect cash prices or deliverability.

At the same time, very few of these futures contracts result in the actual delivery of the commodity as specified in the contract. Traders normally will release themselves from the delivery requirements of a contract by "closing out" their futures position. By arrangement with the exchange, a trader who has purchased a contract can close that position with an offsetting sale. A seller can close his position with an offsetting purchase. For heating oil futures traded on the New York Mercantile Exchange, the percentage of contracts resulting in delivery started at about 7 percent in 1979, declined to 4 percent in 1980, and to 2 percent in 1981, where it remains today.

The relationship between futures and cash market activities, however, cannot be understood by direct observation of futures trading or delivery levels alone. Rather, the important factor is the way that the ability to hedge in futures influences the cash market decisions of the petroleum industry.

In Chapter 4, futures trading and cash market plans are described as being jointly formulated to maximize profits and minimize risk. These rules are used to describe the determinants of industry behavior with and without the presence of futures markets and, thus, to identify the likely impact of futures markets on petroleum supply.

3. The Fundamental Economics of Futures

For potential hedgers, futures markets compete with other means of reducing exposure to risk, including long-term fixed price contracts, adjustment of inventory levels, or even vertical integration to control raw material sources or product outlets. For potential speculators, futures markets provide an alternative to dealing in wet barrels or trading in other risky assets, such as common stock or commodity options. A different set of benefits and costs may be associated with each of these alternatives. Businesses will opt for futures trading only to the extent that their profit-maximization, risk-minimization goals may be accomplished with a greater net benefit.

Benefits from Trading in Futures

Relative savings associated with hedging in futures rather than some other risk-reducing activity can be grouped in three general categories: search costs, transaction costs, and information costs.

First, the costs of locating either customers for a firm's output or suppliers of a needed product at an acceptable price, referred to as **search costs**, are minimized because the clearinghouse function of a commodity exchange brings all these suppliers and customers together under one roof. High liquidity—the presence of many buyers and sellers—is a major factor in lowering search costs in futures markets.

Second, the costs of effecting a transaction between a buyer and a seller are reduced in a futures market because the commodity exchange takes over from the individual traders the legal responsibility for guaranteeing the contract provisions, including price, delivery point, and product quality. Risk of contract default is especially low in futures trading, as explained below.

And finally, a futures market provides instantaneous, low cost information to participants concerning the price and quality of the commodity. Futures trades are based on a single, standardized contract for each commodity, so traders always have precise information about the quality of the product as well as the place and terms of delivery. Because current information on commodity prices is available to both traders and

nontraders alike, these information benefits extend far beyond the futures exchange.

According to industry publications, prices set in the openly competitive futures market are increasingly being used to evaluate spot market sales and long-term contracts. The use of futures for price discovery suggests the influence of futures trading on petroleum supply may be much more significant than would be indicated by the number of industry participants alone.

Costs of Trading in Futures

Up to this point, only the most basic facets of the operation of futures markets have been described. Unfortunately, all is not this simple, and there remain significant costs in using futures to deal with uncertainty in energy markets. Awareness of the basic costs and risks of trading in futures is an important prerequisite to understanding the relationship between futures and cash market activities.

Limitations on the usefulness of futures for hedging may be grouped under four headings: basis risk, competition risk, margin risk, and default risk.

Basis Risk

The **basis** refers to the spread between the cash market price and futures market price. A perfect hedge requires that all change in the value of the trader's cash market position between now and the maturity date of the futures contract be offset by change in the value of his futures position. Thus, a nonzero maturity basis indicates an incomplete hedge. For traders dealing in the physical commodity described explicitly in the futures contract, arbitrage activities in combination with a lifting by the exchange of all limitations on daily price movements during the last weeks before maturity help ensure a convergence of cash and futures prices.

Most commercial traders, however, deal in commodities that differ from the contract (or *par*) commodity with respect to delivery location or product quality. These differences are attributable to normal commer-

cial reasons — local variations in supply and demand conditions. The value of this indirect hedging derives from the presence of a stable or predictable relationship between par and non-par commodities. The degree of protection afforded by an indirect hedge will diminish if the cash prices for par and non-par commodities diverge beyond the trader's expectations. Hedging with futures will still leave traders exposed to this risk.

Competition Risk

For efficient futures trading, both the futures market and the parallel cash market should be sufficiently competitive to preclude the possibility of any individual or group gaining a dominant position that would allow them to influence futures or cash prices to their advantage. The imposition of position limits and the overseeing of trading activity by the exchange are designed to minimize the risk of traders cornering the futures market.

To larger traders, however, the resulting high level of competition in futures markets represents a two-edged sword. While security from market manipulation is a generally desirable goal, for some traders there is also a likelihood that large orders to buy or sell on their own part will directly influence the futures market price to their disadvantage. For example, a large purchase may cause prices to increase, thereby increasing the cost of the hedge, and possibly signaling the trader's cash market intentions to his competitors. Thus, as with major institutional transactions in the stock and bond markets, large traders will need to pay attention to the timing of their purchases and sales, as well as the optimal price and volume, in formulating market strategies.

This competition risk declines with the increasing size of the market, as measured jointly by the open interest and the daily trading volume, but will always be present to some degree for large trades.

Margin Risk

To buy or sell futures contracts, a certain percentage of the market value of the contract must be posted with the trader's broker. This margin is actually a performance bond—as opposed to a downpayment—that will be relinquished in case the trader defaults. If the market value of the trader's position decreases (i.e., the futures price increases for a short position, or decreases for a long position), the trader will be asked to increase his margin. Otherwise, the trader's futures position will automatically be closed out, with the existing margin used to offset the market loss. The daily adjustment of margin positions is termed *marking to market*.

The risk to traders in this situation is that short-term price fluctuations in combination with an inability to raise sufficient cash on short notice to cover one's margin may result in a futures position being prematurely closed out. For a hedger, this would leave his cash market position unhedged and exposed to any subsequent adverse cash price movements. Thus, in trading in futures it is imperative that the budgeting requirements of potential margin calls be considered when deciding the firm's hedging strategy.

Default Risk

A frequently cited aversion to participation in futures concerns the perceived risk of default on the terms of the contract. In this circumstance, a long trader who was counting on taking delivery of product might on very short notice and under tight cash market conditions be left with no supply. One reason for this concern may be the blind-folded nature of futures trading—there is no direct contact between buyers and sellers.

The observed low percentage of contracts resulting in delivery (about 2 percent for heating oil futures) probably reinforces this suspicion. It is to the trader's advantage, however, not to make delivery under the terms of the futures contract if the quality specifications of the firm's product or its preferred delivery time or place differ at all from those set forth in the contract. The hedger can use a futures contract for a standardized product as protection against variations in the price of a nonpar product.

In reality, the risk of default for futures is much lower than that for other trade agreements. A major reason for this is the practice of marking to market, discussed above. Margin deposits are continuously adjusted to reflect the changing value of a trader's futures position, so that any pecuniary incentive to default is minimized. At the same time the clearing members of the exchange accept legal responsibility for meeting all contract obligations, and their cumulative margin deposits may be pooled to help settle accounts in the event of a default. Because of this liability, the exchange continuously monitors all trader positions and requires advance notice of intent to deliver or take delivery. With sufficient advance notice, the exchange can ensure that enough product will be on hand at delivery time to meet all commitments.

Of course, in the event of a very severe supply disruption, well-intentioned suppliers may not be able to fulfill their supply commitments. While the exchange is committed and generally has the resources to make good on the value of all futures positions, it is remotely possible the delivery process could fail. In this extreme circumstance, however, it would likely have failed in the cash market as well. Ultimately, full supply security can only be had by holding physical product (and

incurring full price risk), but the attraction of futures is one of substantial reductions in price uncertainty at the expense of only modest increases in supply uncertainty.

Other Considerations

This and the preceding chapter have reviewed some important incentives for trading in futures. While the statistical analysis presented in Chapter 5 will focus only on the most fundamental hedging incentives of the petroleum industry, an awareness of all the complexities underlying the performance of futures markets is basic to understanding the relationship between futures market and cash market activity. Additional complexities not already mentioned above include:

- The role of speculators. Speculative activity can influence futures prices and, in turn, petroleum supply. Speculative buying and selling will reflect developments in other financial markets as well as short-term responses to news concerning petroleum markets. In general, speculative activ-

ity enhances the efficiency of futures markets by increasing market liquidity and facilitating the exchange of information.

- Cross-product trading. With contracts in crude oil, gasoline, and heating oil, much of the activity in any one of these futures markets will reflect hedging and speculative incentives related to refining costs and, hence, to developments in the other two markets.
- Intermarket trading. Futures in heating oil, for example, are traded in New York, Chicago, and London. The delivered prices in each of these locations should not differ by more than the cost of transporting product between them.
- Trading in different maturity contracts. Much hedging and speculative interest relates to price trends in the future.

Just as these complications make interpretation of futures market activity difficult, additional complexities in the cash market may further confuse the fundamental relationships between futures and petroleum supply. Data on spot market activity, for example, will often reflect the effect of distress sales or temporary supply disruptions.

Question 2. It seems to me that the spot market price of oil tends to follow the futures price and that a large percentage of long-term contracts are now referenced to the spot market. It becomes clear that futures market prices are having a real effect on oil pricing in the cash market. Who are the major players at the New York Mercantile Exchange—how many oil companies, refiners, arbitragers and foreign nationals participate actively in this exchange?

Answer. The Department does not have access to the number of participants in the NYMEX and suggests the NYMEX be contacted directly for this information. It is our understanding that about two-thirds of the participants are involved in the trade, i.e., refiners, jobbers, producers, royalty owners, terminal operators, chemical firms, trucking firms, fleet owners, crude gatherers, and traders. The remaining one-third is comprised of financial institutions and other "speculators" whose participation reflects developments in other financial markets as well as short-term responses to the petroleum markets. Their participation is important in that it enhances the efficiency of the futures market by increasing market liquidity and facilitating the exchange of information.

QUESTION FROM SENATOR MALCOLM WALLOP

Question 1. Recent reports indicate that natural gas is plentiful. What is the supply situation over the near term? Will there be much substitution of natural gas for oil and heating fuel?

Answer. There should be adequate gas supply to meet normal or even above normal natural gas demand in the near term. However, a few days of extreme weather may require curtailment of interruptible customers for that period.

Natural gas production is always higher in the winter months as deliveries to weather sensitive customers increase. However, unless gas demand increases significantly, production levels above normal seasonal increases are not likely.

Underground storage levels as of the end of July 1990 were about 4 percent higher than July 1989. The natural gas industry generally was able to meet its obligations in December 1989 by supplementing supplies from the producing areas with record withdrawals from storage.

The industry was able to deliver very large volumes of natural gas this past winter during the cold December. Under normal weather conditions and substantially less residential and commercial consumption, such volumes could be available for use by other customers if the demand is there. If the price differential between fuel oil and natural gas is favorable to the consumption of natural gas and there are no pipeline constraints, then additional natural gas production can be expected to meet additional fuel-switchable demand.

Question 2. The energy strategy which you will submit to Congress next year is described as a list of options. Due to the need for a more aggressive energy policy, will the report now be structured as an advocacy document, supporting specific energy enhancement and conservation policies?

Answer. Before we submit the energy strategy to the Congress next year, we will submit a report on the strategy to the President in December. It is this report to the President that will contain "options." Once the President has reviewed the options and given us direction to proceed, we expect to complete a report on a National Energy Strategy, which we will submit to the Congress. This report will outline the Administration's National Energy Strategy for both the near- and long-term energy futures. It will include regulatory and legislative recommendations.

Question 3. What is the Department's prediction on new recoverable oil resources within the U.S. (Including off-shore drilling)? What should be the time frame for bringing on new reserves? Is our only short term solution for reducing dependence on foreign oil to speed up production of existing reserves?

Answer. DOE currently estimates that the new recoverable oil resources range from 71 to 125 billion barrels of oil depending on the assumptions for price, access to currently restricted areas, and technology advances. During the last 13 years, the total reserve additions have averaged 2.4 billion barrels per year. Only 0.8 billion barrels per year of this average has come from drilling exploratory wells. The rest of the annual total reserve additions (roughly two-thirds) came from revisions to the reserves of old fields, because of more intensive drilling, improved economics, and the implementation of enhanced oil recovery projects.

There are relatively long lead-times involved in discovery and developing new fields in offshore or frontier areas (the most likely places to find large fields). Therefore, only more intensive development and higher existing field production from known fields offer any short term potential for reducing dependence on foreign oil.